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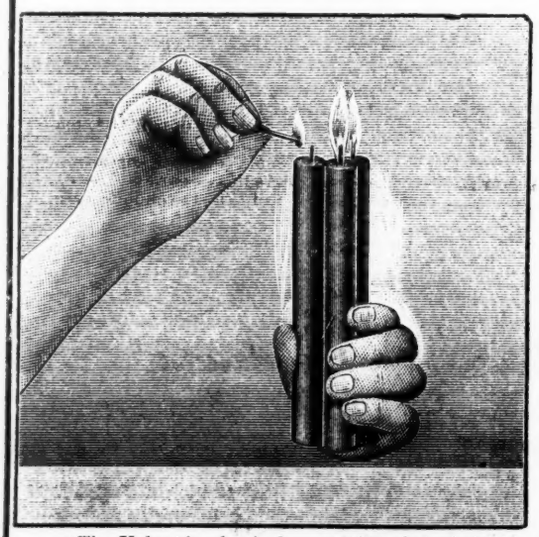

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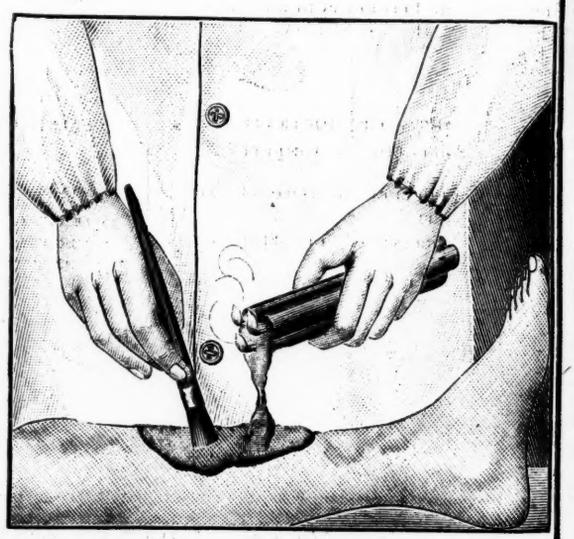

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The Hunterian Oration

ON

BRITISH MILITARY SURGERY IN THE TIME OF HUNTER AND IN THE GREAT WAR.

DELIVERED BEFORE THE ROYAL COLLEGE OF SURGEONS OF ENGLAND ON FEBRUARY 14TH, THE ANNIVERSARY OF HUNTER'S BIRTH.

BY

SIR ANTHONY BOWLBY, K.C.M.G., K.C.V.O., C.B.,

MAJOR-GENERAL A.M.S.; CONSULTING SURGEON, BRITISH ARMIES IN FRANCE; SURGEON IN ORDINARY TO H.M. THE KING.

IN the year 1792 John Hunter finished the last of his works, and dedicated it "To the King."

"May it please your Majesty,

"In the year 1761 I had the honour of being appointed by your Majesty a surgeon on the staff in the expedition against Belleisle.

"In the year 1790 your Majesty honoured me with one of the most important appointments in the Medical Department of the Army, in fulfilling the duties of which every exertion shall be called forth to render me deserving of the trust reposed in me and not unworthy of your Majesty's patronage.

"The first of these appointments gave me extensive opportunities of attending to gunshot wounds, of seeing the errors and defects in that branch of military surgery and of studying to remove them. It drew my attention to inflammation in general, and enabled me to make observations which have formed the basis of the present Treatise. That office which I now hold has afforded me the means of extending my pursuits and of laying this work before the public."

This dedication is dated "Leicester Square, May 20th, 1792," although Guthrie states that "the work was not published until 1794"—that is, the year after Hunter's death; but in spite of the fact that more than thirty years had passed since the period of Hunter's active service before he published his *Treatise*, yet his interest in what he had seen at Belleisle remained so keen, and his description of individual cases is so vivid, that it might easily be supposed he was describing events of very recent occurrence. The whole *Treatise* is quite short, and occupies only fifty-six pages in the octavo edition of 1828.

In the *Roll of Commissioned Officers in the Medical Service of the British Army*, by the late Colonel William Johnston, C.B., published in 1917, Hunter's record reads as follows:

John Hunter, surgical staff, Great Britain, October 30th, 1760. Half pay 1764. Full pay, assistant surgeon-general January 4th, 1786. Surgeon-general and inspector of regimental hospitals March 17th, 1790. Died October, 1793. Belleisle 1761. Portugal 1762.

An interesting fact which is not commonly known is supplied in this brief statement, for it appears that Hunter had acted as "assistant surgeon-general" for four years before his appointment as surgeon-general.

At the time when Hunter went to Belleisle, just two hundred years had passed since Ambroise Paré had published his collected works, and it is not too much to say that military surgery had not advanced materially since his death in 1590. This lack of development was certainly not due to lack of opportunity, for the two hundred years had been years of war, and firearms had quite replaced the arrows and bolts which in Paré's day were still frequent causes of injury, in spite of the then recently invented culverins and arquebuses.

A hundred years later than Paré, the great English surgeon Wiseman had written the most important treatise published since the time of the French master, and in the same year that saw the attack on Belleisle, Ranby, who had attended King George II in his Flanders campaign, published a little book on gunshot wounds. In France the successor of Paré was Le Dran, who in 1740 produced a considerable work on gunshot wounds based largely on Paré, and it would appear that the authors I have here enumerated were the only guides to whom Hunter could have turned for help and counsel when he set out to the wars. It is, however, noteworthy that he does not refer by name in his *Treatise* to any surgical author at all, and that on the other hand he notes: "Little has been written on the subject . . . and what has been written is so superficial that it deserves but little attention." It was indeed left for the following century to provide at its very commencement the men whose work, expanding and extending that of Hunter, laid the foundations of the military surgery of the nineteenth century, and the names of Larrey in France and Guthrie in England will for ever be associated in this connexion.

HUNTER'S WAR EXPERIENCES.

It is of interest to glance for a moment at the wars of John Hunter's lifetime. Marlborough's campaigns had ended in 1711, before Hunter's birth, after his successful but fruitless attack at Arleux on the French line of trenches which lay across France from Namur to the sea at Montreuil; but Hunter was a youth of 17 years when, in the campaign of 1745, the battle of Fontenoy was fought. From that time until shortly before the attack on Belleisle there was a lull in the fighting, and again, after 1763, there ensued a long period of peace, as far as England was concerned, except for the wars in America and India. It thus happened that the opportunity for further work in military surgery was lacking, and Hunter's careful notes of his cases made in 1761 remained without the additions which further wars would no doubt have provided.

His experience of military surgery in the field was thus limited to the Belleisle and Portuguese expeditions, and a brief description of these little known naval and military operations in which Hunter served will not, I think, be out of place. To Mr. A. D. Cary, the librarian of the War Office, I am much indebted for some of the following details.

BELLEISLE.

The first of these expeditionary forces consisted of about ten thousand troops under the command of General Hodgson, and was escorted by a powerful squadron of eight ships of the line and several frigates under Admiral Keppel. Its object was the capture of the island.

Belleisle is off the coast of Brittany, and is about twelve miles in its greatest length and about five miles in its greatest width. It is surrounded by precipitous cliffs, and forms a natural fortress. The chief town was on the northern edge of the island, and was protected by a citadel, garrisoned by about 4,000 men under the command of the Chevalier de Saint Croix. According to the French historian, this garrison was very insufficient, and

Saint Croix, in order to deceive the British as to its numbers, mounted fifty volunteers on farm horses of the island, his efforts being admirably seconded by the female population. The women asked permission to help in this deception, and formed a squadron clothed in red capes. Those who had no horses mounted cows. (Waddington's *La Guerre de Sept Ans.*)

The first attack took place on April 8th, and after an initial success resulted in the repulse of the British with a loss of about 450 killed, wounded, and prisoners. Of these there were rescued 75 British wounded, and there were also captured 54 wounded Frenchmen. All these appear to have been taken for treatment to the ships. A second attack on April 22nd was successful in occupying the island and driving the defenders into the citadel, where they withstood a siege for nearly two months, and finally surrendered on June 7th.

The French estimate of their own losses was 200 killed and 450 wounded, while Fortescue states that "the losses of the British throughout the whole of the operations were about 700 killed and wounded," and he adds: "Thus was Belleisle secured as a place of refreshment for the fleet." It was restored to France on the conclusion of peace in 1763.

PORTUGUESE EXPEDITION.

After the capture of Belleisle, Hunter remained as one of its garrison for nearly a year, for it was not until the summer of 1762 that the opportunity came for some of the troops to embark on an expedition to Portugal, and there is no doubt that he accompanied this force. The explanation of this event is thus described by Fortescue:

The Spaniards on the pretext of Portuguese friendship with England, in April, 1762, invaded Portugal, overran that country as far as the Douro from the North, and threw another force against Almeida from the East. The injured kingdom appealed to England for help, and in May orders were sent to Belleisle for the departure of four regiments of infantry together with a detachment of the Sixteenth Light Dragoons to Portugal. Two more regiments were added from Ireland, bringing the total up to about 7,000 men. (Fortescue's *History of the British Army*, vol. ii, p. 546.)

The force stood on the defensive to cover Lisbon and the line of the Tagus, but on August 27th Brigadier-General

Burgoyne, with 400 troops and the grenadier company of the Buffs, surprised and annihilated a regiment of Spanish infantry and took Valencia, with very few casualties. On October 4th another attack again took the enemy by surprise and resulted in the capture of six guns and other booty, with great loss to the Spaniards, but at the cost of only one man killed and eight wounded to the British. The results of this expedition are thus summed up in the *Historical Records of the Third Foot (the Buffs)*:

> This advantage being obtained at a critical moment was attended with important consequences: the enemy was disheartened; the season for military operations was far advanced, heavy rains fell, the roads were destroyed, and the Spaniards fell back to their own frontiers. Thus Portugal was saved by British valour and British skill.

HUNTER AS AN ARMY SURGEON.

Such, in brief, were the two expeditions in which Hunter saw active service, and it would appear that in Portugal there were very few casualties.

It is probable that in the Belleisle expedition the wounded numbered about 500, although by no means all of them could have been under Hunter's care. It is, however, likely that some of the patients were kept on the island until they had recovered, and so were under treatment for a long time. It is also evident that a certain number of the French wounded were left to the care of the British surgeons, for it was provided by Article XI of the capitulation that "the officers and soldiers who are in hospital in the town and citadel shall be treated in the same manner as the garrison, and after their recovery shall be furnished with vessels to carry them to France."

The actual position occupied by Hunter during his stay on the island has hitherto been somewhat uncertain. I have, however, been fortunate enough to be supplied by Professor F. Wood-Jones with a letter which shows that Hunter was not merely one of a surgical staff, but was in charge of the hospital, for, in addition to his appointment as "Staff Surgeon," he is described as the "Deputy Purveyor," and in that capacity he was supplied by the Government with money to be spent on the hospitals by himself. The letter, dated April 12th, 1762, was written only a short time before the forces at Belleisle were embarked for Portugal. It is as follows:

> Belleisle,
> 12 April, 1762.
>
> Sir,
>
> The Hospital here being in want of money as appears by a letter sent to me this day by Mr. John Hunter the Deputy Purveyor thereof, a copy of which is hereunto annexed, I have in compliance therewith issued my warrant to you of the same date as this letter for the sum of Two Hundred Pounds payable to the said Mr. John Hunter for the use of the said Hospitals, without deduction, but upon account, and do hereby direct and desire (as the Lords of the Treasury have not issued any money to you for the contingencies of this garrison) that you will pay the same out of the money which you have in your hands for the subsistence of the Troops here.
>
> I am, Sir,
> Your most humble servant,
> H. A. LAMBART.
>
> To Charles Bembridge, Esq.,
> Deputy Paymaster General to
> Forces at Belleisle.

An examination I have made of the *Journals of the House of Commons* has disclosed payments as follows:

> Dec. 27th, 1761. To John Hunter, Esq., for the use of the Hospitals, £100 0s. 0d.
> March 10th, 1762. To John Hunter, Esq., for the use of the Hospitals, £100 0s. 0d.
> Ap. 12, 1762. To John Hunter, Esq., for the use of the Hospitals, £200 0s. 0d.

It would thus seem that Hunter was both staff surgeon and the chief administrator of the British hospital at Belleisle. Small though the number of wounded was in those days compared with the tens of thousands of the present day, it is evident that at Belleisle it was sufficiently large to provide Hunter with food for much thought and study. He had no other duty except to care for his soldier patients, no other problems to solve save those of gunshot wounds, and we can picture him on the sea-girt cliffs pondering over the questions which presented themselves to his busy brain, and shaping the newly born thoughts of inflammation suggested by his first experience of war.

It seems to me very possible that we owe more to that period of contemplation on the remote island of Belleisle than has ever yet been guessed, and, as we find Hunter himself saying of his experience of war thirty years later, "It drew my attention to inflammation in general," we shall not be far wrong if we conclude that the germs of much of his most important later work were brought to life in the quietude which followed the siege and capture of the citadel.

THE MILITARY MEDICAL SERVICES IN THE EIGHTEENTH CENTURY.

At the time of Hunter's appointment as surgeon-general in 1790 the army had but one physician-general and one surgeon-general, who were selected from the ranks of eminent civilian practitioners of the day, and it was the duty of the first to supply physicians to the army, and of the second to examine all candidates for appointments as surgeons. The surgeon-general also recommended surgeons and "surgeons' mates" for appointments to hospitals and regiments.

In peace these duties were not arduous, for the standing army was small; but when in 1793 we were obliged to raise ever-increasing armies for the war in Flanders, it became impossible to provide the necessary surgical staffs. Hunter must have had many anxious hours at a time when his health was failing, for his own death occurred within six months of the declaration of war. I will therefore ask you to consider the condition of the medical services in the eighteenth century, and the difficulties which were inherent in supplying the troops with efficient medical officers.

STATUS OF ARMY SURGEONS.

The Army Medical Service, both before and during Hunter's lifetime, left very much to be desired, and the pay and status were such that they offered no inducement to men of skill or learning.

John Woodall, writing in 1639 in his book *The Surgeon's Mate*, says:

> And for the surgeons in his Land service he (the King) alloweth to the Surgeon-Major of the whole camp five shillings a day. Also his Majestie alloweth to each Surgeon two shillings and sixpence a day, which is three pounds and fifteen shillings a month, and to each Mate three pounds a month. . . . And further His Highness hath referred to the ancient Masters and Governors of our Society (i.e., the company of Barber-surgeons) the pressing of all Surgeons and Surgeons' Mates or servants to Surgeons and Barbers.

It is therefore evident that, as the pay was not a sufficient inducement, surgeons were "pressed" or forced, as seamen were forced by press-gangs, to join the service when war called for surgical help.

More than a hundred years later, and consequently after Hunter's experience at Belleisle, the inducements to serve were still not improved, for in 1787, only three years before Hunter's appointment as Surgeon-General, Robert Hamilton wrote:

> Each regiment is allowed a Surgeon, as he is termed, and a Surgeon's Mate. Their business is to attend to the diseases of the men at all times whenever it is judged necessary. For this service the surgeon is allowed four shillings a day; the mate three and sixpence. But out of this are levied from them considerable duties; from the surgeon a shilling, and from the mate sixpence a day. This makes their subsistence equal, so that each is limited to a guinea a week, and on this they must subsist as well as they can.

The pay of John Hunter as staff surgeon is uncertain, but was probably ten shillings a day, for I find in the *History of the Standing Army*, 1660–1700, by Colonel Walton, that a "Master Surgeon-Staff" had 10s. a day at that period, and the pay probably remained at the same figure in 1761. He was also paid 10s. a day as the deputy purveyor. There is no doubt that Hunter joined the army for the Belleisle expedition chiefly in order to obtain a change of duties and surroundings after illness and overwork in London, and when the war came to an end he returned to his studious life, and started practice in Golden Square at the age of 35.

It is evident that one of the chief causes of inefficiency in the Army Medical Service in the eighteenth century was the custom of employing ignorant and often uneducated men as "surgeons' mates." The mate was the assistant of the surgeon and was usually unqualified, except that he might have been a surgeon's apprentice in civil practice. Some few, it is true, were well educated men who had attended lectures on anatomy, surgery, and medicine, but all of them were only "warrant officers,"

and did not hold commissions. So long as there was no war to make demands for an increase of the staff of surgeons, the evil was not very great, but in 1793, on the outbreak of war with France,

> an increase of the hospital establishments of the army became necessary, and, the pay of "hospital" mates being higher, many "regimental mates" transferred to the hospitals as "hospital mates." An increase in the number of surgeons led to the promotion of many regimental mates, and many also purchased commissions. (Colonel Johnstone.)

The result of this was, first, that many of the men who now held commissions as surgeons were very ignorant fellows; and second, that the places of the promoted mates were filled by men of low class, most of whom had no surgical knowledge at all, but were yet in control of the treatment of hundreds of men. For example, we read that on one occasion

> five hundred invalids were embarked from Arnheim in barges under the care of a single surgeon's mate without sufficient provisions, and without even straw to lie on. (Fortescue, *British Campaigns in Flanders*.)

Effects of Maladministration on the Health of the Army.

But not only was the pay and status of the surgeons bad, the administration of all the army was on a thoroughly unsound footing, for after Marlborough's time its efficiency, or the reverse, depended on the Minister in power in England for the time being. Military history shows that in the campaigns of 1793 and 1794, just when Hunter's work was published, mismanagement and incapacity in the Government had reduced the whole army to a state of inefficiency and chaos. Thus, Fortescue writes:

> The men were imperfectly disciplined, there were no efficient company officers to look after them; no efficient colonels to look after the company officers; no generals to look after the colonels. . . . No effort was made to clothe recruits, who received a linen jacket and trousers, and many were sent on active service in this dress, without waistcoat, drawers, or stockings. (P. 372.)

So bad, indeed, was the supply of army clothing that greatcoats were supplied to some regiments by public subscription.

The medical service was such as might be expected when the army as a whole was in this condition, and the state of affairs in July, 1794, is described as follows:

> But the very worst department of all was that of the hospitals wherein the abuses were so terrible that men hardly liked to speak of them. . . . Some kind of a medical staff was improvised out of drunken apothecaries, broken-down practitioners, and rogues of every description who were provided under some cheap contract; the charges of respectable members of the profession being deemed exorbitant. . . . "The dreadful mismanagement of the hospitals is beyond description," wrote General Craig. (Fortescue.)

It will be noticed that this explanation of the rotten state of the medical service was the unwillingness to spend the money necessary for efficiency, and it requires but little study to realize that gross maladministration and peculation of public money were at the root of most of the troubles in all departments of the army.

Hunter had been appointed in 1790 to be "Inspector-General of Hospitals and Surgeon-General in the Army," but he had died on October 16th, 1793, before the breakdown I have mentioned above. As far as I can ascertain, however, his authority did not in any case extend overseas, and, even had it done so, it is quite certain that he would have been powerless to check abuses which originated in maladministration of ministers in England, and which resulted ultimately in the armies being so starved of supplies of food and clothing that by November, 1794, there were eleven thousand sick out of a total force of infantry of twenty-one thousand. It is not too much to say that the collapse and defeat of the British forces in Flanders at that time were brought about more by the want of ordinary care for our troops than by anything else. Even the best medical service is powerless when no provision is made for the ordinary necessaries of life, especially if the combatant officers are as ignorant and inefficient as were very many at that time.

A Modern Contrast.

In the present war the splendid health of our armies has not been due solely to the work of the medical service during the war, good though that has been. It has also been due to the instruction of the combatant officers before the war in the value of good hygiene and of the proper care of the men in camps and billets. This, in its turn, has been supported by the abundance and excellence of the supplies of food and clothing which have everywhere followed our troops throughout the campaign in a never-failing stream; while the supervision and supply of drinking water, the precautions taken to destroy flies and to burn refuse, to inspect and cleanse billets, etc., have all contributed to save life and to avoid sickness. The result is that the invaliding rate from preventable disease in the fourth and fifth years of the present war has been no more than the same rate in times of peace, and, while the war in Flanders at the end of Hunter's life failed largely because of the immense loss to the forces caused by the sickness of the whole army, it is not too much to say that in the present war much of the efficiency and fighting power of the British troops has resulted from the good health and the consequent high spirits of all ranks.

The records of many sieges have proved that sick and half-starved men may hold on to a defensive position and fight well to the last, but it is only robust, vigorous, and thoroughly healthy troops who are capable of enduring the immense strain of pressing home for many weeks in rapidly succeeding battles such a strenuous and victorious offensive as that initiated by the British army on the ever-memorable day of August 8th, 1918, and consummated in the armistice of November 11th.

HUNTER'S WRITINGS ON MILITARY SURGERY.

It is very difficult to appreciate properly the value of Hunter's writings on gunshot wounds at the time of their publication, but their interest for surgeons can be better estimated if it is remembered that no one had previously written much about these injuries for many years, and that Hunter's great reputation and his position as Surgeon-General compelled the attention of every one connected with the medical service.

Superstition and ignorance had united to create the belief that there was something about a gunshot wound which rendered it quite unlike any other, and, to use Hunter's own words, "they have been considered apart from other wounds and are now become almost a distinct branch of surgery." He then proceeds to point out that they are essentially "contused wounds"; although they have certain peculiarities due to the passage of foreign bodies into the tissues, and that they should be treated on ordinary common-sense principles.

Hunter was the first clearly to appreciate and teach that in the gunshot wounds of his time "a part of the solids surrounding a wound is deadened . . . and is afterwards thrown off as a slough which prevents such wounds healing by the first intention." He pointed out how the separation of a slough might open a part of a large artery or a portion of intestine. He realized that "the greater the velocity of the bullet the cleaner it wounds the (soft) parts." He noticed that "when the velocity is small the direction of the wound produced by the ball will, in common, not be so straight, therefore its direction not so readily ascertained, arising from the easy turn of the ball."

He taught the much needed lesson of not interfering with any wound unless a definite object was to be gained. He wrote "we must see plainly something to be done for the relief of the patient by this opening (of the wound) which cannot be procured without it," and he was able by his influence and reputation to alter the practice of the routine opening up of every bullet wound regardless of any indication for doing so, which was a universal custom before he challenged it.

His descriptions of peritonitis following intestinal injury, and of infection of a haemothorax caused by a wound of the lung, are masterpieces of observation and perception, and his opinion that a haemothorax might be advantageously treated by emptying the blood from the pleura, coincides with the practice of the present day.

Primary and Secondary Amputations.

It is evident that Hunter felt, as all surgeons have felt, the difficulty of deciding the best time for the removal of a hopelessly smashed limb, and it seems also clear that his experience of "primary" amputations, with the primitive methods of that day, had been bad. The consequence was that he advocated delay, more especially when the lower

extremity was concerned, but it is not clear what period of delay he had in his mind, for he does not indicate at all how many days he would wait. Here is his view:

> In general, surgeons have not endeavoured to delay it (amputation) till the patient has been housed and put in the way of cure; and therefore it has been a common practice to operate on the field of battle; nothing can be more improper than this practice, for the following reasons: In such a situation it is almost impossible for a surgeon in many instances to make himself sufficiently master of the case, so as to perform so capital an operation with propriety; and it admits of dispute whether, at any time and at any place, amputation should be performed before the first inflammation is over.

Again:

> The only thing that can be said in favour of amputation on the field of battle is that the patient may be moved with more ease without a limb than with a shattered one . . . but it may be observed that there will be little occasion to amputate an upper extremity in the field, because there will be less danger in moving such a patient than if the injury had happened to the lower.

There is no doubt that modern surgeons would not agree that obviously necessary amputations should be delayed for several days, and would advocate their performance as soon as the condition of the patient permitted it. But we must remember that in the year 1760 methods of averting haemorrhage were very primitive, and that severe loss of blood from an operation which followed soon after the primary haemorrhage due to the injury might well prove fatal, when delay might have lessened the risk.

In 1815 Guthrie published his book on *Gunshot Wounds of the Extremities Requiring the Different Operations of Amputation*, and in it he strongly defended primary amputations, and opposed with excellent reason the advice given by Hunter. In this he was certainly in the right, and largely because his opinions were founded on a very extensive experience. Guthrie, at the time I allude to, was very young in years, for he was only aged 16 when he joined the army in 1801 as assistant surgeon. But the time he had spent in the Peninsular war had been a time of constant fighting, and his talents and skill had quickly earned for him a most responsible position in which he had opportunity for much operative surgery.

I therefore desire to direct attention to the results he quotes in support of his own views and in opposition to the advice of Hunter.

Guthrie's Statistics (Toulouse).

	Total.	Died.	Cured.	Percentage of deaths
Primary operations on field of battle:				
Upper extremities...	7	1	6	19
Lower extremities	40	8	32	
Total primary amputations ...	47	9	38	
Secondary operations in general hospitals:				
Upper extremities...	15	3	12	41
Lower extremities	36	18	18	
Total secondary amputations ...	51	21	30	

Guthrie supplies the comment—"The medical duties, both in the field on the day of action and in the hospitals afterwards until the final evacuation of Toulouse, were more immediately under my observation and control"—so that it is clear that the figures given above represent the final results.

But I do not quote these figures merely for the purpose of showing that the practice of primary amputation was to be preferred to that of secondary, but to draw attention also to the fact that these results of primary amputation must be considered very good, and to ask how it was that these patients did so well. No doubt one very important reason was that at the end of the Peninsular war surgeons had become very expert in the act of removing a limb, for the amputation rate was exceedingly high, and in the battle of Toulouse itself no fewer than 98 patients lost a limb out of a total of 1,407 wounded, or about one in every fifteen. It must also be remembered that in many patients the injury which justified amputation in those days was not necessarily so severe as to induce a serious condition of shock, for many amputations were done, not so much because of the serious condition of the limb at the moment, as on account of the complications which could, by experience, be foretold. Thus, it was well known that in few patients with fracture of the femur could life or a useful limb be saved, and all wounds of the knee-joint complicated by any fracture were also treated by amputation. These are conditions for which in the present war we should very rarely advise removal of the limb, unless there were serious complications.

But although Hunter's advice to wait for amputation until "the first inflammation is over" was not accepted by his successors, it must be noted that we do not ourselves advocate operation "on the battlefield," nor should we in these days be satisfied as easily as Guthrie, who says "the military surgeon should never be taught to expect any convenience; his field-pannier for a seat for the patient and a dry piece of ground to spread his dressings and instruments upon are all that are required."

We should further note that Hunter himself advocates removal of a limb at once "if the parts are very much torn so that the limb only hangs by a small connexion," and also that "it may be necessary to perform the operation to get at blood vessels which may be bleeding too freely."

PRIMARY AMPUTATIONS AT THE PRESENT DAY.

In the first place, many surgeons besides myself have always advised that a completely shattered limb should be removed as soon as the patient can be brought into a field ambulance, unless his condition is such as to prohibit any operative treatment at all. There is no doubt in the minds of careful observers that the keeping of such a limb, even for a short time, is most prejudicial to the patient, probably to some extent because of the absorption of toxins from the smashed muscles; as soon as he is rid of it his condition improves. In proportion as shock is severe and the limb is nearly severed, it is not, however, advisable to do at once a formal amputation above the seat of injury, especially if the lower extremity be the one concerned, and it is enough at the moment to sever the remaining tissues with knife or scissors, to tie bleeding vessels, apply a dressing, and then to leave the patient to improve before more is done. This severance of the remaining tissues of the limb requires no anaesthetic, save a small dose of morphine and the tight application of a tourniquet, which causes so much numbness that no pain is felt from the procedure I have advocated. It is especially inadvisable to give chloroform or ether if the conditions require the early evacuation of the patient, or if a formal operation under an anaesthetic is to be shortly performed. A second administration of these anaesthetics after an interval of only a few hours has proved most harmful in such patients, and should certainly be avoided.

In other cases, where the limb is not completely shattered but yet requires removal, it is generally best to splint it carefully, and send the patient to a casualty clearing station, where he can be put to rest in a warm place and be carefully tended till he has recovered from the effects of the journey, has taken plenty of fluid, and has slept. After that, there is generally no object in further delay, but in many cases it is necessary, in order to get the patient into an "operable" condition, to administer fluid of some kind either by the rectum or by intravenous injection. For the latter purpose we have used with good results a 6 per cent. solution of gum arabic, or, if the loss of blood has been excessive, a pint or more of blood has been transfused, and by these means many lives have been saved.

I have already mentioned the inadvisability of two administrations of ether or chloroform, but when a patient is suffering from severe shock or haemorrhage even a single anaesthetization by either of these is very definitely dangerous, and may be quite enough to turn the scale in the wrong direction and prevent recovery. I believe that in such cases as we are considering it is safer to give no anaesthetic than to give chloroform, and ether is not much better. Far the best method of anaesthesia is the administration of gas and oxygen, and amputations may often be performed when the patient is under the influence of this anaesthetic which could not be done at all without it. I am indeed inclined to believe that the success of Guthrie and his contemporaries in primary amputations would have been diminished if chloroform could have been given, and I am quite convinced that it should never be employed in such patients.

During the present war we have gradually, but steadily so improved our methods of treatment of men with severe shock caused by smashed limbs that we are now able to save patients by amputation of an extremity who would previously have died without operation being possible. We are also able to save very many limbs which would four years ago have been lost, and whereas in our longest established general hospitals about one patient in every hundred wounded men lost a limb in 1914–15, in the same hospitals during the past year amputations have been performed in only about one patient out of every 200.

GAS GANGRENE.

It is a curious fact that Hunter has practically nothing to say of the complications of gunshot wounds, and it is evident that those he saw left but little impression on him. In the present war the frequency of "gas gangrene" has greatly impressed all surgeons, for in civil practice it was practically unknown, and its frequency came as a rude shock to the aseptically trained operator. But if it be asked, "Did gas gangrene occur as a common complication in Hunter's time, and has it been of frequent occurrence in other wars?" I believe that the reply should be in the negative. My own belief is that in no previous wars has gas gangrene ever played so predominant a part as it did in France and Belgium in the early part of this war.

It must be admitted by all that acute gas gangrene is so striking and terrible a malady that it could not possibly have been overlooked if it were at all frequent. Yet I find no description of it in Hunter's work or in those of any of the early writers on war surgery, and although the latter wrote chapters on the subject of gangrene or "mortification" it is evident that they refer to that which is due to vascular lesions or else to an extensive smashing of a limb followed by sepsis. It is certain that the so-called "hospital gangrene," so fully described by Larrey as "*Pourriture des Hôpitaux*," was not gas gangrene, but a spreading septic ulceration which characteristically did not occur soon after injury, but rather in suppurating wounds, and was of the same nature as the "sloughing phagedaena" which not so many years ago was rife in wards for venereal diseases. Larrey's contemporary in the French army, Baron Percy, and Guthrie in the British army, give no description of a disease occurring in the Peninsular war resembling the gas gangrene of the present day. There is no mention of its occurrence and still less of its prevalence in the Crimean war; and Professor W. W. Keen, who himself served in the American war, writes to-day: "Personally I never saw a single case in the civil war."

Various French writers described cases of gas gangrene in the Franco-German war of 1870, but, although there is no doubt of its occurrence at that time, there is no evidence that it was generally prevalent.

Coming to still more recent times, gas gangrene never occurred in the South African campaign, and was of quite rare occurrence in the Russo-Japanese war. Finally, I have personally inquired of many surgeons who took part in the Balkan war of 1913, and there is no doubt in their minds that it was very seldom seen.

In the present war gas gangrene has been practically unknown in Mesopotamia, Egypt, or Palestine, and I am informed that it did not occur in the early days of fighting at Gallipoli, although it was occasionally seen later on. At the Salonica front it has been of comparatively rare occurrence, and it has not been prevalent on the Italian front.

It is well known that at the beginning of the war in France and Belgium the medical services of all the combatants were quite inadequate to deal thoroughly with the immense numbers of wounded. Most of the latter at the time of the retreat from Mons and in the fighting on the Aisne had to be evacuated to base hospitals before any surgical treatment could be carried out. There were practically no hospital trains in those days, and the railway services were so crowded with supplies for the armies that traffic of all kinds was exceedingly slow. The result was that the wounded, placed when opportunity offered in the luggage vans of empty returning supply trains, were frequently several days in reaching their destination after being wounded, and great numbers of them were suffering from extensive gas gangrene on arrival, or had succumbed to it *en route*.

During the ensuing first battle of Ypres and the succeeding winter it was still an exceedingly frequent complication. It diminished very much during the next summer, when there was also much less fighting, until the battle of Loos in September; during that battle it was much increased. In 1916 it was less evident until the heavy casualties of the battle of the Somme filled the hospitals with wounded, many of whom developed gangrene; during the fighting at Arras and Vimy in the cold and stormy spring of 1917 there were still very many cases, in spite of good surgical work at the front. From that time, now nearly two years ago, gas gangrene rapidly diminished, and during 1918 it was comparatively little in evidence, at any rate in its worst forms, as will be gathered from the following samples of figures from the base hospitals during heavy fighting.

Gas Gangrene in 1917 and 1918.

A. Of 5,270 consecutive patients from the Messines battle (in June, 1917) there were only 22 cases of gas gangrene.
B. Of 3,690 consecutive wounded at the beginning of the Passchendaele fight (in August, 1917) there were only 16 cases of gas gangrene.
C. Of 3,200 at a later stage of the same fight 7 cases.
D. Of 2,900 patients in July, 1918, there were 11 cases of gas gangrene.
E. Of 10,000 wounded in August, 1918, there were 27 cases.

It will therefore be seen that out of a total of about 25,000 patients at base hospitals in 1918 only 84 patients had serious or "massive" gas gangrene; this is an incidence of about one case in three hundred wounded men, and many of these had multiple wounds or badly smashed limbs.

If the question is now asked as to the causes that account for the great diminution of this grave affection in 1917–18 it must first of all be noted that:

(*a*) The ascertained cause of gas gangrene is the presence of certain well-recognized anaërobic organisms which are present in highly dunged and cultivated soil, and are absent from that of the South African veld or the sun-dried sand of Egypt and Palestine, while they are present in small numbers and are apparently less virulent on uncultivated land in Eastern Europe.

(*b*) The organisms concerned have little power over healthy tissues, but they are resistant to the strongest antiseptics and grow freely in damaged muscle, especially if into the latter be thrust some foreign body rich with the organisms, such as a piece of muddy clothing. Some of the very worst cases are those where the "missile" is composed only of the mud itself driven with immense force by a shell or bomb exploding in muddy ground, and frequently causing a great number of small wounds, in some of which the mud may be driven right through the deep fascia or actually into the muscle sheath.

(*c*) Lowered vitality of the patient, due to exposure to wet and cold, to exhaustion from want of food, or to overexertion, is a predisposing cause, as is also to a very serious extent the deprivation of blood supply, owing to injury of a large vessel. It is also clear that wet and cold weather and mud favour gas gangrene much more than heat and dust.

Such are the now well-recognized causes of gas gangrene and the conditions in which it may be expected to occur, and very much of the reduction now noticed is due to the abandonment of strong antiseptics, and to the timely excision and surgical cleansing of the wound and the removal of all foreign bodies. It may also be claimed that the thorough arrangements for the treatment of the chilled and exhausted man by warmth, rest, and intravenous injection have saved many lives by restoring the vitality and resisting powers of the patients.

But, when all this is allowed for, it is evident that there must have been other causes at work to account for the diminution of this danger to the wounded man, and these must be sought in a lessened virulence of the infecting agent itself which has occurred during the past four years and has in its turn resulted from altered conditions of the soil in which the organisms are bred. That this is true is supported by the following facts:

In the Somme battle of 1916, in spite of many thousand operations performed at the front, there were very numerous cases of bad gas gangrene both in the casualty clearing

stations and at the base hospitals, although they were much less frequent than in 1914. In the Somme fighting over the very same ground, during the retreat in March, 1918, when the casualty clearing stations had to be abandoned, operations could not be done at the front. Patients had consequently to be sent to the base in trains of all kinds as well as in ambulance trains, and were often not thoroughly treated by surgical operation till after a delay of one or two days. Yet there were far fewer cases of gas gangrene in 1918 than in 1916, and in 20,000 patients at one base between March 23rd and 29th during the worst time of the retreat the incidence was only 1 per cent.

But, whereas in the earlier years of the war much of the land was covered with rich crops and had recently been very freely manured, at the present time in the battle areas the face of the earth is absolutely changed. A great stretch of country comprising many hundreds of square miles has been practically destroyed, as far as its development by mankind is concerned. What was once a prosperous countryside with highly cultivated arable land is now little more than a desert, pitted with shell holes, scarred by innumerable trenches and gunpits, the chalk subsoil scattered over the surface of the ground, the skeletons of smashed and shredded trees alone marking the sites of destroyed villages, and all appearance of cultivation wiped out. The whole land has gone back to "prairie conditions," and looks like an extensive and barren moor, although in summer time it is partly redeemed by the luxuriant growth of wild flowers. In such a country which has been exposed to sun, wind and rain for three or four years, uncultivated, unmanured, uncropped, deserted by man and animals, it is probable that the anaërobic organisms have diminished both in numbers and virulence. But, be the causes what they may, it was an immense relief to the surgeon in 1917–18 to find that this, the greatest surgical epidemic of wound infection which has ever been recorded, was neither so prevalent nor so dangerous as formerly, and that the wounded man was no longer so greatly exposed, even though his wound itself was slight and involved no vital part, to grave risk of life or limb.

TRANSPORT AND HOSPITALS AT THE FRONT.

I now propose to turn to the arrangements for transporting and treating wounded men. The history of the early hospitals in the British army has been carefully investigated by the late Colonel William Johnstone, and from his researches it appears that in Hunter's day the patients at the front were treated in "Regimental Hospitals" or else in "Garrison Hospitals." "Marching" Hospitals or "Flying" Hospitals were established by William III, and first saw active service in his campaign in Ireland. In addition to medical personnel they had "nurses, cars for the transport of the sick, drivers, and men servants." Unfortunately these precursors of our present Field Ambulances came to an end with the completion of Marlborough's campaigns in 1711, and were not revived until the nineteenth century, so that they did not exist in Hunter's time. Ranby wrote in 1781 as follows:

> I would wish to be indulged in a scheme which might, I think, be put into execution with all the facility imaginable. It is this: when the Army is forming for an engagement, let the surgeons with their respective mates of the three or four regiments that are posted next to each other collect themselves into a body, and take their station in the rear according to the command of the general. Here let the wounded be put under their immediate care and management. By this means they will be enabled mutually to assist each other, and to perform their duty both with care, exactness, and dispatch.

It is thus evident both that the need of some arrangement for mutual aid was felt, and also that it did not exist in Hunter's time. In those days the wounded soldiers were taken to the base in country wagons or in the regimental forage carts, and it was left to Larrey to create, in 1792, the first ambulance cars, which were reserved for the sole use of the sick and wounded, and which were named by him *Ambulances Volantes*. He figures and describes them as "a kind of carriage hung on springs, uniting great strength and solidity." They were of two kinds—the light with two wheels and the heavy with four wheels. Each ambulance "cadre" or "division" was provided with twelve light and four heavy cars, and comprised a personnel of 340 officers and men. Larrey states that after the battle of Eylau in 1807 the wounded were successfully transported by the ambulances volantes to chateaux "at a distance of not less than fifty-five leagues." This "division" may fairly be claimed as the first efficient field ambulance in the history of war.

Since this period horse ambulances of various types have been employed as part of the transport of our own field ambulances, but it was not until the present war that "Motor Ambulances" were added to the transport of the Field Ambulances and that "Motor Ambulance Convoys" were provided to supplement the latter.

I think it is hardly realized how much in present warfare the whole system of the treatment of the wounded is based upon and pivots on the "motor ambulance." In Hunter's time the range of the musket was two or three hundred yards, and that of a cannon less than a mile; beyond this distance surgeons could work in safety. It was consequently not at all difficult to carry the wounded to some place where a barn, or shed, or a stone wall offered sufficient protection—for there were no shells.

At the present day there is no such thing as absolute safety anywhere near a battle front, for, apart from bombs and guns of exceptional range, immense numbers of shells are fired to a distance of from six to eight miles. The consequence is that, while surgeons supply skilled help, at much risk, at the Regimental Aid Post or the Advanced Dressing Station, within a very short distance from the line, the patients have to be removed quickly to considerable distances, and the Casualty Clearing Stations have to be placed some eight miles or more in the rear. The consequence is that horsed vehicles could not possibly make a sufficient number of journeys to bring in the wounded from heavy fighting within a reasonable time, and, in addition, the numbers of the wounded are so great that there has been nothing in any previous war to compare with the task of the ambulances of the present day. It must therefore be understood that all wounded men have now to be taken a considerable distance before reaching a place where they can be both immediately treated by the surgeons and also retained and cared for after operation.

It is during this long motor car journey from the battle front that the patient runs risks of those further injuries which it is the object of the surgeon to minimize as much as possible. One of these risks is exposure to cold, and this is a most serious danger to men suffering from shock or haemorrhage. To avoid this, hot-water bottles are freely used, stretchers are covered with one folded blanket and the patient is warmly wrapped in others. The car is also usually provided with a pipe heated by a supply of hot air from the exhaust pipe of the engine. The other most important risk is that of injury to the soft tissues by the fragments of broken bones which are jolted by the movements of the car. The extent of this will largely depend on the roughness of the road and its pitting by shells, but to a still greater extent it will depend on the care with which suitable splints have been applied. It is the custom in the British army to splint all fractures as far forward as possible, and in any case at the Field Ambulance, with the result that, with the apparatus now provided, fractures are so immobilized that the minimum of risk is incurred, and the minimum of pain caused, by the journey. It is not too much to say that very many patients who, without a good splint would arrive in a state of collapse and die, or else would lose their limbs, now get down to the Casualty Clearing Station with discomfort rather than with suffering.

It has been remarked that the modern offensive methods which characterize this war are largely dependent on the invention and development of the petrol engine, and that the tractors of great guns, the war in the air, and the war under the sea are all dependent on this device. It is at least some satisfaction to know that it is to the same device that tens of thousands of wounded men owe not only a more comfortable transport than the soldiers of previous wars, but also the saving of lives and limbs in numbers beyond measure.

THE CASUALTY CLEARING STATIONS.

In Hunter's day the only hospitals near the front seem to have been those called "Regimental," and they were apparently established in any buildings which seemed suitable for the purpose. I have not found any records of

their equipment, the number of their personnel, or their accommodation. It is probable that they were very primitive.

In our own army at the present day the demand for hospitals at the front has resulted in a new unit which has been created by the conditions peculiar to this war. I allude to the Casualty Clearing Stations, and these have their counterparts in the armies of all the other European combatants.

This unit had not been in use before the present war. At the commencement of hostilities it consisted of a staff of six medical officers with a commanding officer and quartermaster and 80 orderlies; some of the latter were well-trained nurses. It provided accommodation for 200 patients on stretchers, but was not supplied with beds. Its surgical equipment consisted merely of sufficient instruments and appliances for the performance of a few urgent operations, and it was provided with one operating table and a few very primitive wooden splints. Its function, as the name implies, was "to clear" the Field Ambulances and to pass on by train the sick and wounded for further treatment at the base hospitals. Each unit was intended to be attached to a Division, and was supplied with horsed transport.

Since those days the long line of trenches and the comparative immobility until recently of the armies have provided the opportunity for very great developments, with the results that the Casualty Clearing Stations of the present day are very efficient and well-equipped advanced hospitals, with theatres for six or more tables, and suitable in every way for the performance of any operation. They have expanded to provide, according to circumstances, for from 600 to 1,200 patients, of whom 200 have beds and the remainder stretchers.

A great deal might be said of the work of the Casualty Clearing Stations which would be out of place here, but it may be pointed out that an advanced hospital of this type is an absolute necessity in the warfare of the present day. Very little experience was required to show that it was quite impossible to carry out the pre-war idea of doing all the surgery (with few exceptions) at the General Hospitals at the base. Men with such injuries as wounds of the chest and abdomen, severe fractures and wounds of large vessels could not be safely conveyed long distances by train, while patients suffering from dangerous shock or the effects of profuse haemorrhage demanded immediate treatment as near the front as possible. But, over and above all this, the necessity which arose for early operation in order to prevent the development and spread of gas gangrene or dangerous sepsis in even slight wounds alone justified the expansion of the Casualty Clearing Stations.

VALUE OF FRONT LINE SURGERY TO AN ARMY.

It will thus be seen that the object in view in their development was to secure efficient treatment as early as possible. The ideal of surgical treatment would be the supply of enough surgeons and enough hospitals, close to the front, to allow of all operations being always performed there with the least possible delay. This ideal has indeed often been realized in the present war, when, during quiet periods, the wounded were comparatively few, but it has proved impossible to supply enough surgeons and enough accommodation to realize the ideal when the casualties of a great battle number many thousands a day and when the duration of the battle is measured not by days but by weeks or months. Yet, although it has not been always possible to do that which is ideal, the custom of reinforcing busy hospitals with "teams" of extra surgeons, anaesthetists, and assistants has enabled an immense amount of work to be done. Apart from operations on the abdomen, the chest, and the head, the vast bulk of this work is of a nature which appeals to surgeons and to patients alike, for it is "conservative surgery" in the best sense of the term. In the first place it consists largely in the thorough surgical cleansing of wounds so as to save limbs and lives, and in the second place it supplies the necessary foundation for the early closure of the wounds by suture. In this way large flesh wounds are prevented from suppurating, and compound fractures are made simple fractures, and the patient is saved from a long illness and its debilitating effects. Such treatment diminishes stay in hospital, frees hospital beds, lessens the labour of nurses and surgeons, and, best of all from the point of view of the army, it enables many patients to recover quickly and to return to their regiments. I would claim that, apart altogether from considerations of humanity, good front line surgery very fully compensates an army for the demands it makes on supply and transport. It more than pays its way both by returning sound combatants to the ranks and also by saving the country the expense of innumerable pensions on behalf of men whose lives or limbs have been saved.

Long before this war the combatant branches of the army fully realized the importance of the prevention and cure of illness and their effects on the maintenance of armies in the field, but it is only during the present war that the value of good and prompt surgery has been fully appreciated, and that the necessary facilities have been supplied whenever the military situation has permitted. Similar facilities will henceforth be expected in all future wars.

THE THIRD BATTLE OF YPRES.

It is well known to the medical profession that an immense amount of this front line surgery has been successfully undertaken, and it is also well known to and deeply appreciated by the combatants of all ranks, whose confidence and faith in the Army Medical Service is by far the best possible tribute that could be paid to it. I will not attempt to supply any statistics, but some idea of the magnitude of the surgical work at the front will be gathered if I state that during the three and a half months of the third battle of Ypres, in 1917, 61,500 operations were performed under anaesthetics in the Casualty Clearing Stations of two armies.

It will easily be realized that much forethought and preparation are required to produce these results, for they require not only arduous work by day and night for perhaps twelve hours out of twenty-four—a tax on the strongest when continued for weeks on end—but also the harmonious working from the front to the rear of stretcher-bearers, regimental medical officers, field ambulances, ambulance convoys, and ambulance trains, any one of which is liable to interruption by accident or by the act of the enemy.

The staffing of the Casualty Clearing Stations for the third battle of Ypres especially deserves to be recorded, for on this occasion many of the most leading and representative surgeons from the United States, from Canada, Australia, New Zealand, and South Africa were included in the reinforcing surgical "teams," or else were on the staffs of the Casualty Clearing Stations of the armies concerned.

Thus, for the first time in history, the surgical skill and talent of all the various sections of the Anglo-Saxon race were brought together on a battlefield, and with the happiest possible results to the wounded men. On this occasion, because of the absence of heavy fighting in other armies, more surgeons were available than at any other period, and no Clearing Station had less than twenty-four surgeons and twenty-four nurses. It was therefore possible to keep eight operating tables in action in every unit, and there is no doubt that almost every wounded man whose condition made it advisable was passed through the operating theatre before being sent by ambulance train to the base.

The war of movement which characterized the closing stages of the campaign called for the development of new methods for meeting the situation thus created. Of the details of these a great deal might be written which would be too lengthy for the present occasion, but this much may be said: The Clearing Stations were sufficiently reduced in the bulk of their equipment to enable them to be rapidly moved forward, and they were frequently able to take in and treat many hundreds of men within twenty-four hours of their arrival on a new site, while at no time during the whole campaign was there more work done in resuscitating the badly wounded, and in the intravenous administration of blood or of alternative fluids to men who had suffered from severe haemorrhage.

CONCLUSION.

Let me now recall to your attention a phrase of Hunter's which I read to you at the beginning of this address. "It (the appointment to the Belleisle expedition) drew my attention to inflammation in general, and enabled

me to make observations which have formed the basis of the present Treatise." The war was to him not merely a sphere for the exercise of his surgical skill, but also an opportunity for observing and studying conditions of which he had hitherto had no experience. What has this war been to the surgeons of the present day? It may truly be said that very many of them, and in all parts of the world, have entered into this work imbued with the spirit of our great master. To them also it has not only afforded immense opportunities of helping their fellow countrymen, but has also provided problems for study and for solution. The spirit has been one of progress and of development, and of unwillingness to rest content with conditions that might be bettered or with methods which proved unsuitable. It is not too much to claim that each year of war has seen better surgical measures devised and consequently better results obtained. The sufferings of the wounded have been lessened, the dangers they run have been diminished, and lives and useful limbs have been saved in constantly increasing numbers. Surgeons have not been content merely to guess at possible answers to the never-ending questions suggested by the complications of war. They have devised new methods to meet new conditions and have put them to the test of experience; and when they have failed they have tried and tried again until they have compelled success.

In this great tragedy of war the Royal College of Surgeons of England has played no unimportant part. Hundreds of its Fellows and thousands of its Members have willingly pressed forward for service. Some of them, like our President, have occupied with credit and honour the most prominent and important positions, and others of them, often less prominent no doubt, have not only given their services, but have also given their lives. The position I have had the honour to hold in the Army Medical Service has afforded me very abundant opportunities of appraising the performances of others, and I am full of admiration both for the skill and ability of our surgeons and for the splendid work done by the Royal Army Medical Corps in rescuing the wounded in conditions of unprecedented difficulty and danger, and in organizing the hospitals for the subsequent treatment and restoration to health of the British soldier.

CAPACITY FOR WORK IN AMPUTATIONS OF THE LOWER EXTREMITY.

BY

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THE accompanying diagram is intended to demonstrate in a graphic manner how capacity for work varies in amputations in the lower limb. Textbooks on operative surgery afford little information on this important aspect of a subject which is now an economic as well as an operative problem.

"*Capacity for Work.*"

The term "capacity for work" ought to mean not merely the ability to do a certain class of work, but rather the ability to keep on doing it from day to day. A man's value in the general labour market depends as much on his being able to "keep time" as on the actual amount of work which he can do. In regard to discharged soldiers, this question is put to the medical officer: "By how much is the man's earning capacity lessened by his amputation?" The answer to this question does not depend alone on the length of the natural as compared with the artificial limb, for whilst some low amputations are bad, giving a low capacity for work, other comparatively high amputations are good, allowing the man to become a very efficient and steady worker.

Before considering the special features upon which capacity for work depends, let the functions required of an amputation of the leg with its prosthesis be for a moment considered.

1. *Support.*—This demands an investigation of how the weight of the body is transmitted to the ground through the natural and the artificial limb. The best form of support is that obtained through a direct end-bearing stump. Indirect or lateral bearings at some time or other cause fraying and ulceration of the skin, and require much more care on the part of the patient if broken time is to be avoided.

2. *Stability.*—This varies directly with the length of the natural limb, and with the length of the segment in which the amputation has been performed. With short stumps the grasp of the socket may not be sufficient, and must be improved by a splice in the form of a laced socket, or in thigh stumps a pelvic band. In some cases stability has to be attained by stiffening of the joints of the artificial limb at the hip or knee, but this interferes with the gait.

3. *Progression.*—This depends on the use of natural rather than artificial joints, good muscular power in the lever which activates the artificial limb, a long lever, and painless bearings. In short stumps we find progression accompanied by fatigue. This could be diminished by decreasing the weight of the artificial limb. The excuse of limb makers that the natural limb weighs much more than the artificial one is really irrelevant, for the muscular power of acting muscles is greatly diminished by disuse, by interference with their insertions, and only a few muscles are effective at all.

4. *Appearance.*—Appearance is of no importance as far as function is concerned. Compared with a limb giving comfortable support, efficient stability, good progression, and lightness, appearance counts for nothing. The French have long since recognized this by supplying a peg leg with a broad base for special workers like farm hands who have to be on foot all day.

Estimation of Capacity for Work.

Having laid down these general principles, what further considerations influence "capacity for work"? They are:

1. The length of the natural as compared with the artificial limb.

2. The specific value of the ideal amputation at the particular level.

3. The type of prosthesis most suitable for the particular stump. Prostheses for some amputations are constantly requiring repairs whilst others last for years.

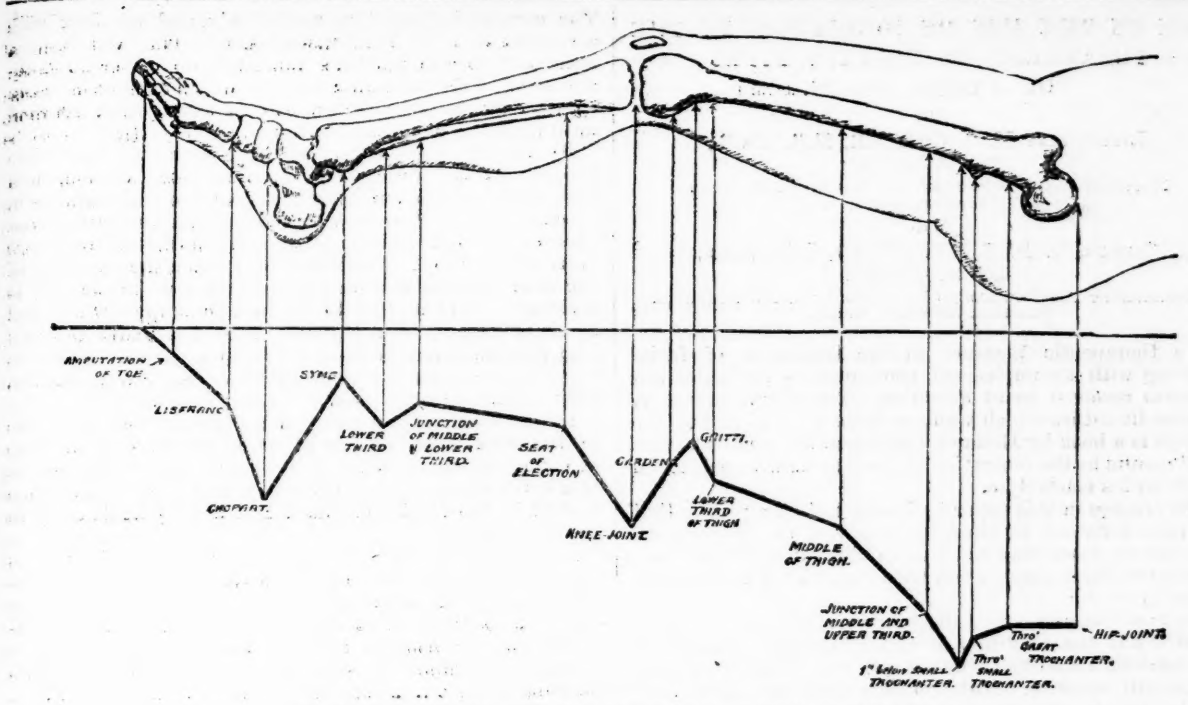
4. The special conditions which prevail in the case under review—that is, how far the particular amputation falls below the ideal amputation at the same level.

All these points ought to be considered in estimating the capacity for work of a man who has had an amputation in the lower limb. The fourth point will be governed by the disposition of the flaps, position of the scar, the presence or absence of pain, adhesions between bone and skin, condition of joints, and by whether the surgeon has succeeded in obtaining an end-bearing stump. These points will demand consideration in every individual case, and therefore cannot be reckoned with in attempting to map out a curve of "capacity for work" in amputations of the leg in general.

I have tried to represent in a graphic manner the fact that capacity for work does not vary in a regular manner as we pass up the limb, though it will be seen by reference to the graph, and conceded on general principles, that the longer the natural as compared with the artificial limb the greater the capacity for work. The secondary irregularities on the curve are due, therefore, to variations included under heads 2 and 3—namely, the value of the ideal amputation, and the type of artificial limb or appliance supplied for amputations at the given level.

Following the graph from left to right it will be seen that amputation of the great toe is, in my experience, followed by some slight fall in capacity for work, though amputation of the other toes may be performed with impunity, the operation not being followed by diminution in the man's capacity for "keeping time."

With a Lisfranc amputation there is a further drop in the capacity curve, which, however, falls much more with the Chopart operation. The French orthopaedists, especially Trèves, have shown that of all the amputations in front of the ankle the Chopart is the worst. Trèves points out that every centimetre that can be saved in amputations on the foot increases the value of the anterior *point d'appui*, and therefore increases the efficiency.



Graphic representation of capacity for work in amputations of the leg.

An amputation in front of the scaphoid is an improvement on the Chopart; one through the shaft of the metatarsals is better than a Lisfranc, and so on till we reach the toes.

To explain why the capacity curve falls so low in a Chopart amputation we take the two heads already mentioned, and we find (1) that even the ideal amputation interferes radically with the mechanics of the foot by removing completely the anterior pillar of the arch; the scar, at first placed anteriorly, or even above, the ends of the bones, will work its way downwards; the bones themselves are gradually drawn upwards by the tendo Achillis, and this gives rise to an increasing potential equinus, nearly always associated with some varus; and (2) the prosthesis for Chopart's amputation requires very frequent alteration and repair owing to changes in shape of the stump and to the very nature of the prosthesis itself.

With Syme's amputation we find the curve rising abruptly, indicating that the ideal performance of this amputation leaves a stump which is, from the point of view of function, as nearly as possible perfect. It gives (*a*) a complete and permanent end-bearing; (*b*) there is a long lever affording perfect stability; and (*c*) the preservation of the natural knee gives almost, if not indeed quite, perfect gait. The only criticism to be offered is that the artificial ankle, owing to the presence of the side bars, is rather bulky and *disgracieuse*.

Proceeding upwards to the lower third of the leg we find the curve dropping. According to Huggins, an amputation should never be done at this level, because of the atrophic condition of the skin which tends to ulcerate, so precluding the possibility of a good end-bearing. The absence of an end-bearing entails a lateral bearing at the level of the tibial tuberosities with the disadvantages of irritation, blistering, and often sepsis of the skin. The presence of the fibula causes a bunion, often painful, and pressure on the external popliteal nerve, as it winds round the neck of the fibula, will demand at some time or other surgical intervention.

In the middle third of the leg the graph is gradually falling as we shorten the lever till we come to the "seat of election" problematically so called. This point must be regarded as the extreme "limit of shortness" in below-the-knee amputations. The curve above this point rapidly drops, reaching its lowest point in the Stephen Smith disarticulation through the knee-joint. This is decidedly bad as a definitive operation, because (*a*) a complete end-bearing is never possible; (*b*) the skin over the condyles is stretched, thin, and very prone to ulcerate, even apart from pressure; and (*c*) the fitting of an artificial limb is handicapped by the very shape of the stump, consisting as it does of a large bulb on the end of an attenuated shank.

In the lower half of the thigh there is a gradual fall in capacity for work, dependent on the shortening of the lever formed by the stump. But with a perfect Stokes-Gritti operation there are advantages over the slightly longer Carden amputation, in that it gives a complete and permanent end-bearing, and the presence of a layer of compact bone, rather than a sawn surface, prevents any risk of adhesions between the bone and the skin over it. Above the mid-thigh there is, in addition to shortness, the disturbing factor of the pelvic band, which frequently gets out of order and calls for repairs. Therefore we find a rapidly diminishing capacity for work above this point till the "limit of shortness" in thigh stumps activated by the stump in an ordinary bucket is reached. Huggins lays it down that this point must be not less than three inches below the lesser trochanter. In amputations between this point and the lesser trochanter no satisfactory fitting can be supplied, and they are, therefore, the worst of all amputations, and should never be performed as definitive operations. At the level of the small trochanter it again becomes possible to fit an artificial limb through the intervention of a hip platform. The thigh bone, being flexed by the psoas, does not interfere with the fitting, though an amputation carried through the great trochanter or the femoral neck, or a disarticulation through the hip-joint itself, gives a slightly better result.

My thanks are due to Lieut.-Colonel A. B. Mitchell, O/C the Special Surgical Military Hospital, Belfast, for advice and assistance freely given at all times; to Captain R. J. M'Connell, my house-surgeon, for his helpful criticism, and to Mr. R. W. H. Blackwood for the great pains he took to make the drawing a clear representation of the subject.

A SPANISH medical mission headed by Professor Martinez Vargas, dean of the faculty of Barcelona, and comprising a number of professors, hospital physicians and surgeons, and heads of laboratories, recently visited the Hôtel-Dieu, Cochin, Saint Louis and Buffon hospitals in Paris, the military medical school at Val-de-Grâce, the Colonial hospital at Nogent, the Spanish hospital at Neuilly, the Canadian hospitals at Saint Cloud and Joinville, the physiotherapeutic services at the Grand-Palais, various laboratories, the Pasteur Institute and hospital, the Edith Cavell school, and the general workshops of the health service. The mission was received by the Société de Médecine, at a meeting presided over by the Minister of Health and attended by representatives of all the medical societies of Paris and the profession of France, and the Allied and neutral countries.

NOTE ON THE USE OF IONIZATION IN THE TREATMENT OF CERTAIN TYPES OF FACIAL SCARS.

BY

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As a therapeutic measure in the treatment of facial scarring with its unpleasant consequences, ionization has hitherto received scant attention. The only reference in current literature which we have been able to find on the subject is a book by Hollande[1] in which the author claims good results by the ionization of these scars with potassium iodide as his electrolyte.

We propose in this paper to demonstrate the results that we have obtained by ionic treatment of facial cicatrices consequent upon war injuries to the facial tissues, and especially where damage has been done to the masticatory muscles.

Perhaps the commonest disability arising from this type of injury is the condition of "false" trismus, manifested by deficient mandibular movement and inability to open the mouth properly. Hitherto such conditions have been treated by intermittent intra-oral gagging, and by massage of the scar area, with transient good results but a strong liability to recurrence. We have already noted elsewhere[2] that this clinical condition is due commonly to one of three causes:

1. Fracture of the ascending ramus of the mandible, with actual damage to contiguous tissues.
2. In the absence of fracture, injuries of such a nature as to involve some fibres of the masseter, temporal, or pterygoid muscles, the scar tissue limiting movement.
3. Reflex spasm of all the masticatory muscles consequent upon organic injury of remoter parts.

In the more marked cases, as will be seen from the list recorded below, the degree of separation possible between the upper and lower incisor teeth may be as small as three millimetres.

We have found that the treatment of the scars by ionization results in a progressive decrease in their densities and an increased flexibility, both subjective and objective, with marked permanent improvement in ability to open the mouth and masticate. This has definitely occurred even when ionization has been unaccompanied by the use of intra-oral gagging or facial massage. Adherence of the scar to osseous tissue offers greater resistance, and the treatment has to be prolonged in these cases, often for a period of three months or more.

Method of Ionization.

We have used the alternating current from the city mains, which is run through a motor transformer so as to give a constant current of 100 volts E.M.F. This is conveyed to the patient through a distributing board, fitted with a wire resistance rheostat for the purpose of varying the strength of the current, and with a milliammeter for registering the amount of current used. The electrodes consist of small zinc plates about two inches square, between which and the skin we place from sixteen to twenty-four layers of folded lint. These coverings are about half an inch larger all round than the metallic electrodes, in order to prevent possible burns by contact of the metal with the skin. The pad of the negative or active electrode is soaked in the therapeutic agent (in our cases NaCl, KI, or sodium salicylate) in 1 or 2 per cent. solution in hot distilled water. The pad of the positive pole is soaked in hot water to which a trace of sodium chloride has been added to ensure easy passage of the current. The negative electrode is placed over the cicatricial area, whilst the positive electrode is placed under the chin (most often) or over the deltoid or on the nape of the neck. These are made secure by bandages which also ensure efficient contact with the skin area to be treated. The current is turned on very slowly, and we start with a current of 2 to 3 milliampères, gradually working up, according to the patient's tolerance, to 15 or 20 milliampères. The maximum current which each patient can support comfortably varies, and is usually not reached until the third or fourth treatment.

By this gradual method we have been able to obviate the unpleasant after-effects of headache, vertigo, and nystagmus, which are liable to occur from the passage of an electric current so near to the semicircular canals and their endolymph system. The duration of each treatment is from thirty to fifty minutes, daily when the condition of the skin permits and on alternate days when the skin is sensitive. It is useless to attempt ionization when oral sepsis is present, or, at any rate, until it is under control; also it should not be used while metallic foreign bodies exist in the tissues, otherwise burns are liable to occur, with the formation of slowly healing ulcers.

In the event of an abraded surface happening to be in the area under treatment, it is sealed with a drop of collodion which is allowed to dry before proceeding. If a small indolent sinus persists, it is plugged with gauze soaked in the electrolyte used and usually heals early in the treatment.

At the end of each treatment the current is always gradually reduced before withdrawal to avoid unpleasant subjective shock to the patient. It should be remembered that the ionic effect is directly proportional to the intensity of the current and the time of application, so that as large a current as can be comfortably borne should be used, and the treatment should be of a long rather than short duration.

Mode of Action.

Ionization with sodium chloride as an electrolyte has given us the best results; ionization with iodides is more apt to cause irritation of the skin, but is useful, as is ionization with sodium salicylate, in the alleviation of painful conditions. As far as softening the scar is concerned, the latter two drugs are less effective, in our opinion, than sodium chloride (chlorine ions).

It is said that the liberation by secondary reaction at the cathode of the hydroxyl ion, which like the hydrogen ion is one of high velocity, may contribute to the resultant effects, and we can confirm that the results obtained with the negative pole as the active electrode are greater than those obtained with the positive. There seems to be no doubt, however, that a considerable portion of the resultant good effects, is due to the condition of induced hyperaemia which persists for an hour or two after the cessation of treatment. It would seem highly improbable that the ions penetrating the tissues, or formed in the tissues by the passage of the current, retain their ionic or active state locally for more than a fraction of time, but that they immediately enter the general circulation in combination as inert substances. It has been stated that ions are introduced into the endocellular plasma and not into the general circulation, but we fail to see why such a permeable membrane as the cell wall should act as a confining barrier to the highly active ion, or why the cell plasma, which is isotonic with the surrounding exocellular plasma, should exercise any chemiotactic effect upon the ion. Hence any benefit due to introduction of ions or to ionic dissociation in the tissues, must be limited to the time of passage of the current and to the period of active bombardment during the actual treatment.

The following list summarizes the nature of 24 cases with the results of treatment. Chlorine ions were used where there is no statement to the contrary. Supplementary treatment is indicated where any was employed.

1. Pte. O'C. Dense scar, masseter; limitation of opening. Fourteen treatments; current up to 20 milliampères. *Result:* Scar very soft and pliable; complete restoration of ability to open mouth.

2. Sgt.-Maj. E. Small dense scar, right masseter; limitation of opening. Twenty-five treatments; current up to 26 milliampères. *Result:* Scar much softer; mouth opening increased from 7 to 15 millimetres.

3. Cpl. P. Two dense scars (adherent to underlying bone) in right masseter region; limitation of opening 3 millimetres. Fifteen treatments; current up to 20 milliampères; gag used. *Result:* Improvement; scar softer; mouth opening increased 3 to 7 millimetres.

4. Pte. S. Dense radiating scar of left cheek. Eighteen treatments; current up to 22 milliampères; iodine ions. *Result:* Scar decreased considerably in size and density.

5. Pte. W. Extensive radiating scar, right cheek and right submaxillary region; limitation of opening. Fifteen treatments; current up to 22 milliampères. *Result:* Scar decreased in density (scar adherent to bone).

6. Lce.-Cpl. P. Long dense scar in right temporal region; limitation of opening. Fifteen treatments; current up to 24 milliampères. *Result:* Scar considerably softer; opening increased from 5 to 20 millimetres.

7. Driver W. Dense scar, left temporal region; limitation of opening. Twenty-five treatments; current up to 20 milliampères; gag used. *Result:* Improvement very slight.

8. 2nd Lieutenant J. Small dense scar, left masseter and left internal pterygoid region (adherent to bone). Fifteen treatments; current up to 10 milliampères. *Result:* Scar softer; ability to open mouth increased 10 to 25 millimetres.

9. Sgt. C. Dense radiating scars from angle of mouth to angle of mandible on same side; limitation of opening. Twelve treatments; current up to 14 milliampères; iodine ions. Massage employed. *Result:* Mouth opening increased from 4 to 12 millimetres; scar softened and loosened considerably.

10. Pte. H. Small depressed scar, left temporal region; painful; limitation of opening. Fourteen treatments; current up to 15 milliampères; iodine ions. *Result:* Pain decreased; otherwise improvement slight.

11. Pte. M. Dense depressed scar, right masseter region; limitation of opening. Twelve treatments; current up to 20 milliampères. *Result:* Scar considerably softer, but development of an abscess interferes with continuation of treatment.

12. Pte. F. Dense scar, right masseter region; limitation of opening. Eighteen treatments; current up to 20 milliampères; gag used. *Result:* Mouth opening increased from 3 to 10 millimetres; scar much more flexible.

13. Pte. K. Extensive cicatrization in left angle of mandible region; painful. Twenty-four treatments; current up to 20 milliampères; salicyl ions. *Result:* Scar considerably softer and more pliable; total absence of pain.

14. Pte. J. Extensive dense depressed scar, right masseter region; limitation of opening. Twenty treatments; current up to 20 milliampères. *Result:* Improvement slight.

15. Pte. P. Large depressed scar, right masseter region; limitation of opening. Twelve treatments; current up to 24 milliampères. *Result:* Mouth opening improved; scar less dense.

16. Pte. L. Dense scar, left masseter region (adherent to bone); limitation of opening. Eight treatments; current up to 9 milliampères. *Result:* Scar softer; mouth opening increased from 5 to 10 millimetres.

17. Cpl. W. Depressed scar, left masseter region; limitation of opening. Sixteen treatments; current 9 to 14 milliampères; gag used. *Result:* Mouth opening 3 to 8 millimetres; improving slowly.

18. Sgt. O'H. Long depressed scar, left temporal region; limitation of opening. Twelve treatments; current 7 to 11 milliampères; gag used. *Result:* Considerable improvement; mouth opening increased 5 to 10 millimetres.

19. Pte. W. Injury pterygoid region; passage of bullet from supraorbital region to lower border of mandible of same side; limitation of opening; complete closure. Eighteen treatments; current up to 20 milliampères; iodine ions; gag used. *Result:* Mouth opening increased from almost complete closure to 2 centimetres.

20. Lce.-Cpl. R. Dense depressed scar, right temporal region; limitation of opening. Fifteen treatments; current up to 10 milliampères; iodine ions; gag and massage employed. *Result:* Improvement slight.

21. Pte. B. Small scar, right angle of mandible; limitation of opening. Fifteen treatments; current up to 10 milliampères. *Result:* Mouth opening increased from 4 to 9 millimetres.

22. Pte. T. Dense scar, right temporal region. Six treatments; current up to 6 milliampères. *Result:* Improvement so far very slight.

23. Pte. W. Small depressed scar, masseter region; limitation of opening. Ten treatments; current up to 10 milliampères; massage employed. *Result:* Improvement marked; mouth opening increased 8 to 14 millimetres.

24. 2nd Lieutenant M. Long dense depressed scar, left temporo-mandibular region; limitation of opening; incomplete facial palsy. Eighteen treatments; current up to 20 milliampères; massage employed. *Result:* Marked improvement; mouth opening increased from 2 to 12 millimetres.

From the above notes we may conclude that ionization in the treatment of facial cicatrices is of undoubted value. The circulation through the scar tends to become re-established; there is loss of stiffness and adherence, permitting the play of underlying muscles and reduction of the limiting effect of the scar upon the masticatory muscles. It is a therapeutic measure which we think may be with advantage combined with the mechanical procedures of intermittent intra-oral gagging and massage. We find the results best when the gag is applied for an hour immediately before treatment. In cold weather it is a good thing to thoroughly warm the area to be treated with hot water, or by the use of radiant heat by means of a small cup reflector for fifteen minutes before commencing ionization.

In cases also where the edges of the flaps, after facial plastic operations, are rolled and thickened, causing retraction of surrounding normal tissue, we have found ionization of use in increasing the softness and flexibility, and so in diminishing the deformative effects of such scars.

In conclusion, we should like to thank Lieut.-Colonel Littlewood, C.M.G., the administrator of this hospital, for the encouragement and facilities he has afforded us; Captain J. le F. Burrow, R.A.M.C.(T.), officer in charge of the Neurological Department, for much help and criticism, and Captain W. Maxwell Munby, R.A.M.C.(T.), and Captain J. E. Mawer, R.A.M.C.(attd.), for their courtesy in sending us additional cases.

REFERENCES.

[1] Hollande; *La Restauration Maxillo-Faciale*, Paris, February, 1918.
[2] *British Journal of Surgery*, No. 21, 1918.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

SHELL WOUND OF THE HEAD WITH LARGE FRAGMENT LODGED IN CEREBRUM: AFTER-HISTORY OF PATIENT.

As a rule the medical officer serving with the forces abroad is unable to follow cases of gunshot wound of the head and to hear what eventually happens to them, though probably those who are on pension boards see a number of old cases. It would be interesting to determine what proportion of these cases recover and how many later on develop cerebral abscess or mental symptoms, and when these dangers may be considered past. In the following case—of which I regret that, owing to the great pressure of work, I was unable to keep better notes—I had the opportunity of observing the condition nearly three years after the wound.

Pte. F. was admitted to my ward in a base hospital towards the end of September, 1915. He was quite unconscious, with flaccid paralysis of all limbs and symptoms of cerebral compression. There was a wound 4½ in. above and ¾ in. anterior to the left external auditory meatus. A skiagram showed a large shell fragment lying in the right cerebral hemisphere. I trephined without delay (he had been wounded two or three days previously) at the site of the wound, enlarging the trephine hole with nibbling forceps. A large intracranial clot was evacuated and a few fragments of bone were removed from the superficial part of the track in the cerebral tissue. No attempt was made to remove the shell fragment.

The patient made an uneventful recovery, except for the fact that a few days after the operation he developed a small cerebral hernia, which soon subsided. He was then evacuated to England.

After-History:—About six months after receiving his wound he had his first fit. For a time he had a fit about every fortnight, and then about every six weeks. Eleven months ago he married, and had no fit till six months later. This fit was succeeded by an interval of three months without a fit, after which he had two fits on the same day. When seen in August, 1918, he had had no fit for two months. He had been working as a labourer for ten months, and for the last six months had been in a china warehouse earning 35s. a week. His wife stated that mentally he was quite normal. He stated that he gets practically no warning that a fit is coming on, and his chief anxiety is that he may get one while crossing a road in traffic. The fit involves the whole of the right side, including the face, arm, and leg, the head being turned strongly to the right. The twitching lasts about a minute, after which he remains unconscious for about another minute. For half an hour after he feels dazed.

When he was examined in August, 1918 (nearly three years after the receipt of the wound), no abnormality in reflexes, etc., was found. He did not suffer from headache. All the cranial nerves appear to function well.

A skiagram taken for me by Dr. R. T. Cooke showed a large oblong foreign body. Dr. Cooke calculated that the shell fragment is 3¾ in. deep (from left side), and that it is lying slightly to the right of the middle line.

Personally I do not consider any further operation advisable, as I think it might well leave him in a worse condition than he is in at present.

E. N. RUSSELL, M.B., B.C.Cantab.

CONDITION OF MUSCLES IN DISABILITY OF THE KNEE.

IN certain cases of unilateral knee-joint disability there is hypertrophy of the calf with atrophy of the thigh on the affected side.

In a typical case, in which the left patella had been injured by gunshot but recovery took place with normal range of flexion, the left thigh was 1¼ in. smaller, while the calf was ½ in. larger, than the right.

This association may be found in cases of trouble inside or outside the knee-joint or affecting the extensor muscles, but, I believe, only in cases of moderate disability where the patient walks with slight or no limp, and the action of the lower extremity as a whole is maintained and increased action at the ankle and foot compensates the knee defect.

In a series presenting increasing knee-joint disability there may be shown less and less hypertrophy of the calf; a case with great disability will probably present moderate atrophy of the calf with great atrophy of the thigh.

I would be glad to know where in the literature I may find further information on this interesting point, as it appears to have definite value in estimating disability.

Liverpool. H. GRATTAN JOHNSTON, M.D., F.R.C.S.E.

PNEUMOCOCCAL PERITONITIS IN AN ADULT.

J. M., aged 53, was admitted to hospital on December 24th, 1918. He stated that for about two weeks he had had a little abdominal pain and slight cough, but he remained at his work until the evening of December 23rd, when the pain suddenly became more severe.

On admission the temperature was 99.6°, the pulse 100, respirations 30; the lower part of the abdomen was very tender and rigid, and there was hyperalgesia rather worse on the right side, but a little lower down than is usual in appendicitis.

As appendicitis seemed the most likely cause for the symptoms, I opened the abdomen by the usual gridiron incision. On cutting the peritoneum a quantity of pus appeared; this was diffused through the whole cavity and no primary focus could be dicovered. It resembled the pus frequently found in empyema—a thin fluid with masses of fibrinous material in it. The coils of intestine showed a few loose adhesions. The appendix was removed, but, except for the fact that the surface took part in the general peritonitis, the organ was healthy. The pus was mopped up and the cavity drained. The pneumococcus was found in smears and cultures from the pus.

The temperature rose to 100.6° on the day after the operation, but fell to normal on the following day, and the patient was discharged cured on January 20th.

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Reports of Societies.

SITE OF MALIGNANT STRICTURE OF THE OESOPHAGUS.

AT a clinical meeting of the West London Medico-Chirurgical Society held at the West London Hospital on February 7th, with the President, Lieut.-Colonel E. M. WILSON, C.B., C.M.G., in the chair, Dr. REGINALD MORTON showed a series of radiograms illustrating a short paper which he read on the most common site of malignant stricture of the oesophagus. The author stated that during the previous nine years he had examined in the West London Hospital many cases where this condition was supposed to be present, a proportion of which gave a negative result. Ignoring the latter, there remained sixty-six cases of definite obstruction practically all of a malignant character—less than half a dozen where the spasmodic element was the sole or predominating feature. He suggested that by *x*-ray methods the most common site of malignant stricture of the oesophagus would soon be decided. To determine this, radiologists should agree on some uniform division of the tube for purposes of description, and these divisions must have relation to familiar landmarks seen in that locality during *x*-ray examination. The division that he had adopted was chosen solely because of its convenience. The upper part lay above the sterno-clavicular joint; the next corresponded to the aortic arch and extended from the sterno-clavicular joint to as far below the arch as the joint was above it; the third portion included that part of the tube where it pierced the diaphragm; and the last one was the region immediately at and including the cardiac orifice. They might be described as (1) the upper, (2) the aortic, (3) the diaphragmatic, and (4) the cardiac portions. Applying this division to the series of sixty-six cases, eliminating one that was purely spasmodic as subsequent events proved, stricture occurred with equal frequency in the first and third portions, and also with almost equal frequency in the second and fourth portions. The disparity between the first pair and the second pair—"the odds and the evens"—was very striking, the latter being nearly four times that of the former. This contrast could be well shown in a tabular summary, thus:

1. Upper (suprasternal)	7
2. Aortic	25
3. Diaphragmatic	7
4. Cardiac	26
Total	65

ERYTHRAEMIA.

At a meeting of the London Association of Medical Women held on February 4th at the rooms of the Medical Society of London, with the President, Lady BARRETT, in the chair, Dr. FRASER showed a case of erythraemia.

The patient, a married woman of 60, had for many years noticed some blueness of the face and hands during cold weather, with occasional epistaxis, but it was only after the death of her son in France eighteen months ago, which distressed her greatly, that she noticed swelling of the abdomen and other symptoms—for example, frontal headache, a feeling of fullness in the head, pain in the upper abdomen, and some loss of flesh. When admitted to the South London Hospital for Women in February, 1918, there was congestion and cyanosis of the skin of the face, ears, and neck; the mucous membrane of the mouth and tongue was purplish in colour, and the conjunctivae were injected; there was discoloration of the forearms and hands, and some dilatation of the veins of the legs. The arteries were thickened, the blood pressure measured 128 mm. of mercury; the heart was normal. A blood examination showed: Red blood cells 9,510,000, and white blood cells 30,000 per c.mm.; haemoglobin 130 per cent.; colour index 0.7. A differential count gave: Polymorphonuclear cells 86.8, lymphocytes 8.6, hyaline cells 1.4, and eosinophil cells 1.5 per cent.; no abnormal cells were seen.

The liver was enlarged, the edge being palpable three inches below the costal margin in the mid-clavicular line; the spleen formed a hard, somewhat nodular mass in the left hypochondrium, extending to the level of the umbilicus. The urine contained a trace of albumin, the specific gravity was 1013 to 1018, the urea excretion was fairly good, and there was no evidence of organic kidney disease.

The case was treated with calomel and saline aperients and a somewhat restricted diet. *X*-ray treatment was applied to the spleen. Venesection was not done. The subjective symptoms had now to a great extent disappeared, the liver was smaller, and the spleen, though not much changed in size, felt less hard; the abdominal pain was relieved by a belt, and the patient was living an ordinary life with little discomfort. The last blood count showed 8,000,000 red blood cells, 13,000 white cells.

Dr. Fraser then briefly discussed the etiology and pathology of the disease.

Dr. INNES PEARSE referred to the mental improvement sometimes seen in these cases after the performance of venesection, and mentioned a case of death closely following on *x*-ray treatment of such a spleen.

THE DANGER OF METAL ARTICLES WORN BY RADIOLOGISTS.

IN the course of a discussion at the Röntgen Society on February 4th, on the subject of protection in diagnostic work in view of the effects of scattered and secondary *x* rays, Dr. F. HERNAMAN-JOHNSON said that metal articles worn about the body, such as watches, rings, sock suspenders, or even coins in the pocket, might be a source of danger while working on *x* rays if the protection arrangements of the tube and couch were imperfect. Otherwise, given adequate protection of the apparatus, the only part for which the radiologist need feel concern, or which he need protect by body armour, was the hand used in examination. Dr. J. METCALFE gave some details from his own

experience. He said that he had been accustomed to wear a silver watch on his wrist under his lead-rubber glove, while doing *x*-ray work, and an ulcer had developed, corresponding in size and position to the watch. It proved to be an *x*-ray burn; it was curious that the leather strap of the watch which came between the metal and the skin was not sufficient to protect the skin from burning. He had also had trouble from burns developing on both legs under nickel suspenders attached to the socks. He thought it probable that if metals of higher atomic weight were used trouble would not arise. Dr. N. S. FINZI expressed doubt as to whether the burn on the wrist could be due to secondary radiation, because he believed the secondary rays from silver would be completely absorbed by less than the 2 or 3 mm. of leather between the watch and the skin, but Dr. HERNAMAN-JOHNSON said that by photographic experiment he had proved that the secondary *x* rays produced from silver had an effective therapeutic range of 1½ cm. in the body (or in water), and experiments carried out by the ionic methods showed that the range was even greater; he did not believe that the leather would wholly absorb them.

Reviews.

CRIME AND CRIMINALS.

DR. MERCIER has embodied in his new book, *Crime and Criminals*,[1] the results of his lifelong study of the subject. His early writings on this and cognate subjects—psychology, conduct, responsibility, and insanity—which to his mind are all bound up together, have been illuminating, and have shed new light upon aspects of the human mind and of its operation in the individual in his personal and social relationships. For this new book Dr. Mercier has been awarded the Swiney Prize—a distinction now twice obtained by him for works on criminal jurisprudence—in itself a high tribute to his ability to deal with the subject on which he now writes.

In a short introduction by Sir Bryan Donkin, who is well acquainted with the criminal by practical experience during many years, the book is commended as "an outstanding and lasting contribution to the study of criminal jurisprudence, and as differing widely from the numerous and unsatisfactory writings on crime and criminals."

Theologians, sociologists, anthropologists, psychologists, and anthropometricians have each in turn used theories and statistics in the study of the causation of crime, have claimed the criminal for their own, and laid down laws for his reformation, deterrence, segregation, or extinction. Dr. Mercier will have none of these. He sweeps aside their theories and their statistics, and, surveying the field of crime and criminality from the pedestal of common sense, declares crime to be merely a matter of conduct, reduces its votary to the category of an ordinary human being, and ascribes all his lapses, occasional or habitual, from the path of rectitude to deviation from the standard laid down by all civilized communities. The foundations of this standard are set on the basis of custom, religion, and social-protective law.

Dr. Mercier uses the term "crime" in a comprehensive sense and not in the more narrow sense of some writers on "criminology," who would limit its application to the more serious and indictable class of offence, and he includes in the term "criminal" all offenders against the law.

His first postulate is that "crime is merely a form of conduct, and therefore is subject to the usual laws regulating conduct, is marked by the characters of conduct, and is analysable into the elements into which all conduct can be analysed." He then proceeds to argue that crime, as well as all other varieties of conduct, is a form of action, and that all action—criminal and non-criminal—is due to the influence of two factors, the one inherent in the constitution of the individual, and the other dependent upon external circumstances and surroundings—the first factor internal or temperamental, the second external or environmental. In discussing these two factors Dr. Mercier, with his customary close, cogent, and incisive reasoning, sets out to show that all action by the individual is prompted by instinct and guided by reason, and that the internal factor is alike in no two persons, and is modified in strength and degree by hereditary predisposition and intellectual capacity, by powers of self-restraint, and by formed habits. The external factor in the production of crime is opportunity or temptation.

From these two factors of conduct Dr. Mercier evolves his theory of crime. Certain laws to regulate conduct having been laid down by society, the offender against these laws becomes a criminal. His crime may be a petty offence against some municipal by-law, or it may be theft, forgery, or murder. All men are potential criminals, and if one man in certain circumstances commits a crime and another does not there must be something in the nature or experience of the two persons to account for their difference in conduct. In Dr. Mercier's opinion, this difference is quantitative not qualitative. All men have certain internal qualities of mind. Their mentality is composed of the primary compartments of Desire, Intellect, Feeling, Will, and Memory, and it is to the predominance of one or more of these qualities of mind in different individuals that deviations from, or continuance in, the path of rectitude results. In those with better balanced minds, Desire—which with its antithesis, Aversion, is the root cause of criminal actions—is kept within bounds by the other faculties, and self-control and self-denial counterbalance and render ineffective the instinctive promptings to offend when temptation and opportunity offer. In those with less well-balanced minds selfishness and self-indulgence are the predominating factors. They cannot or will not control the desires, emotions, and passions, and, given favourable opportunity, an offence results. "Each man has his breaking point. This breaking strain varies in different people, and in the same person is different for different temptations, but every one has his breaking strain in some direction or other, and if in this direction he is tempted beyond his strength he will fall." "There but for the grace of God goes Richard Baxter." "But for the absence of sufficient temptation every man is a criminal." This, shortly, is Dr. Mercier's explanation of the cause and origin of criminal conduct.

In applying his deductive reasoning to the individual offender Dr. Mercier divides criminals into two classes, his test being their temperamental tendency to succumb to temptation, according, first, to the ease with which they succumb, and secondly, to the kind of temptation to which they are most fallible.

> He whose breaking point is low, and who consequently will easily succumb to temptation, will frequently succumb and become an habitual criminal. He whose breaking point is relatively high, or whose low breaking point is in a region not much exposed to temptation, will seldom succumb, and if he becomes a criminal at all, will be only an occasional criminal.

This is an entirely common-sense view, and affords a valid explanation of so-called criminal tendencies and the "criminal diathesis." If Dr. Mercier's reasoning be sound—and it will not be easy to prove it erroneous—it sweeps aside the doctrinaire teaching of the various schools of criminology, whether they ascribe the genesis of the criminal to purely hereditary causes, to defective mind or body, to antisocial proclivities, to improper early environment, or to Divine wrath.

That certain of these factors do take a part in the formation of the criminal Dr. Mercier admits, but that the individual's mode of life depends entirely on any one of these he denies. Temptation is held to be a very potent factor in the commission of crime of any kind, and previous writers on the subject, it is contended, have not attached sufficient importance to this factor. Dr. Mercier recognizes two classes of the habitual criminal—the ordinary oft-convicted criminal who leads a life of crime but is to be considered fully responsible, and the moral imbecile, who at an early age deviates into crime, who is mentally defective, and has not the will power to organize his life in a normal manner or to settle down to steady honest work. For him there is no hope of reform. Institutional life is best for him, and this, it is to be expected, will soon be arranged under the Mental Deficiency Act.

For the confirmed ordinary criminals—men who do not try to avoid crime, whose breaking point is low in the presence of temptation and opportunity, and whose selfishness and aversion from honest labour lead them on the line of least resistance, gamblers on the chance of escaping

[1] *Crime and Criminals.* Being the Jurisprudence of Crime—Medical, Biological, and Psychological. By Charles Mercier, M.D., F.R.C.P., F.R.C.S. London: University of London Press, Limited. 1918. (Demy 8vo, pp. xvii + 291. 10s. 6d. net.)

punishment and lured by the desire for easy gain—for these hope of reformation is small: preventive detention for a period of years is the only means of ridding society of their presence, and of giving them a fair chance of reformation. If they can be caught young there is greater hope, as in many such instances want of moral training and bad associations and companionships contribute to their character and conduct. To meet their cases detention in a Borstal institution for a period has been found effective. In many instances they have made good.

It is to the successful working of these three institutions—mental deficiency institutions, preventive detention prisons, and Borstal institutions—that we must look in the future for a decrease in crime. All of these owe their initiation to the policy of the chairman of the Prison Commission and his board, among whom the past and present medical members have been prominent.

Into other sections of Dr. Mercier's most interesting and instructive volume space will not permit us to enter. His classification of crime is new, based as it is on international, state, private, and family or racial crimes. The three chapters devoted to this subject are deeply interesting, and will well repay perusal. The book is epoch-making in many respects, and can be read with both pleasure and profit. It is an intellectual treat as well as a closely reasoned scientific treatise, and both from a literary and an educational point of view it is a work of very high order.

NOTES ON BOOKS.

WE doubt whether there exists in any country an annual so compact and comprehensive as *Whitaker's Almanack*.[2] The new edition for 1919 appears later than usual, but through this delay the editor has been able to bring some of the information down to a late date. There are few things more difficult than to recall the facts of recent history, and even in a matter of such overwhelming interest as the war it is not easy to set in order at short notice the sequence of events. Therefore we may give praise to the diary of the war, which occupies some twenty pages of this volume. As is the custom, a certain number of special articles on topics of the day are inserted. There is an innovation in the shape of two maps, one showing the racial divisions of Europe and the other the roads, rivers, and cities of Mesopotamia. The volume has again increased in size, and for this reason and because of the increased cost of production the price has been raised, a result which appears to distress its editor as it certainly will its purchasers.

The New Hazell Annual and Almanack for 1919[3] has been edited by Mr. T. A. INGRAM, M.A., LL.D., and is published as one of the Oxford University Press publications. It is compiled on lines similar to its rival, but has certain characters of its own. In the first place the print as a rule is larger, there are fuller data with regard to secondary education, and very many useful particulars with regard to pensions, and a series of maps, including one showing "how the Germans were pushed" during the operations recorded by Field-Marshal Haig in his historical dispatch of last December.

[2] London: 12, Warwick Lane, E.C. (6s. net.)
[3] London: Henry Frowde, and Hodder and Stoughton. 1919. Thirty-fourth year of issue. (Crown 8vo, pp. 996 + liv. 6s.)

EXTENSION OF INSTITUTIONAL MEDICAL SERVICES.

WE have received from Dr. J. Middleton Martin, county medical officer of health for Gloucestershire, a memorandum on institutional services, written for the information of the various bodies in the county concerned with these matters. Dr. Martin begins with the proposition, with which few will disagree, that the facilities for institutional treatment are most inadequately distributed and do not effectively provide for the needs of the community. This shortage has become more acute at the present time for various reasons, such as the difficulty in providing special treatment for disabled ex-service men and for persons suffering from venereal disease. One way of overcoming the difficulty would be the development of a series of special services for each purpose somewhat on the lines of a tuberculosis scheme. Against this is the fact that separate schemes with separate staffs in the same area would not be economical.

Dr. Martin has excluded the consideration of domiciliary treatment from his memorandum. Assuming that some extensions of institutional treatment, including that for out-patients, are likely to take place at once, and that further extensions will probably come in the near future, Dr. Martin contrasts the alternative two lines of development. Many will agree with him in opposing the creation of a new organization in water-tight compartments for the treatment of specified ailments, or of special groups of patients. Dealing with the argument that *ad hoc* institutions are necessary in order that specialists might attend them, he agrees that specialists will form an essential part of the plan which he favours—that is, the development of existing institutions—but holds that their place would be in the special institutions, since the great bulk of cases do not require specialist treatment. Here the experience of the tuberculosis dispensaries is valuable. A large part of the work of a tuberculosis officer has proved to be general consultant work, in a wide variety of cases presenting symptoms which might be due to tuberculosis, but which are often due to other conditions. In any case, therefore, a medical man attending at *ad hoc* clinics must necessarily have had a wide training.

Thus, as an alternative to the building up of a system competing with existing arrangements, Dr. Martin advocates an extension of the present facilities for institutional treatment, so that they may provide adequately for the whole of the areas they are supposed to serve, and the scheme he suggests is briefly as follows: In the first place out-stations should be opened in connexion with each hospital in all populous parts—in fact, a series of "forward" out-patient departments for each hospital. These out-stations would be attended by a whole-time medical practitioner of consultant standing, who would examine all the patients in consultation with the medical attendant, give such treatment as is practicable in an out-patient department, and arrange for the admission of cases needing in-patient treatment. Instead of a whole-time consultant it has been suggested that the out-stations might be run by the hospital visiting staff with the co-operation of local practitioners. Intermediate treatment would also be given at the out-stations by trained masseuses, orderlies and nurses, under medical direction. One great advantage of such out-stations would be the opportunity for real consultation between the medical attendant and the consultant in cases in which this is impossible under present conditions. In the next place Dr. Martin would link up existing general and special hospitals and cottage hospitals to form a coherent system with facilities for interchange of patients when necessary. The additional beds needed could, he suggests, be found partly in existing Poor Law infirmaries, and partly by the establishment of a few special and small general hospitals.

The object of the scheme is thus to provide, with the minimum of outlay and the maximum of efficiency, co-ordinated facilities for the treatment of special cases—for example, tuberculosis, venereal disease, and conditions needing massage and other simple subsidiary surgical treatment—which could otherwise be made generally available only by the opening of a special centre for each purpose in each place, with separate staffs. The advantages that would follow the abolition of all *ad hoc* centres, and the development of a system of out-stations in connexion with each general hospital for the treatment of all conditions under a whole-time travelling consultant, are set out by Dr. Martin as follows:

1. It would be economical.
2. Existing hospitals are already the recognized centres of the best treatment given to the public.
3. General practitioners would be able to consult effectively with the hospital staff, and medical services of the community would be greatly improved from the increased facilities for the treatment of all conditions.
4. Such a scheme would not only provide for all immediate requirements for the care of ex-service men, and the treatment of tuberculosis, venereal diseases, and defects of school children, but would also fit in well with the probable developments of the future.

A resolution by the local War Pensions Committee in favour of the principle has been approved by the Gloucestershire County Council, which has generally adopted it also for a scheme of treatment of school children. The scheme has been submitted to the Govern-

ment departments concerned, and much may be learnt from a practical trial. The experiment would be watched with keen interest by all concerned in the provision of an adequate medical service, and a county is a convenient area for its application.

THE HUNTERIAN FESTIVAL.

THE Hunterian Festival of the Royal College of Surgeons of England was, for the first time since the war began, celebrated with full honours on Hunter's birthday (February 14th). Sir Anthony Bowlby delivered the Hunterian oration (published at p. 205) in the afternoon, and in the evening the President and Council entertained to dinner in the library a large company, including many men distinguished in public life and in the medical profession.

After the usual loyal toasts, and after the memory of John Hunter had been honoured in silence, Sir GEORGE MAKINS, G.C.M.G., in giving the toast of "The Visitors," recalled how we had been heartened at the beginning by the forwardness of the Dominions to stand with us in this as in the South African war, and how later we had been cheered by the tangible evidence of America's co-operation afforded by the arrival in this country, at a time of great need, of American medical officers, the first of the American army actually to serve in Europe. He dwelt on the fine response of the civil profession at home to the call for officers for the medical services of the navy and army, and expressed the hope that the same spirit would be shown in the work of reconstruction. In coupling the toast with the name of Sir Arthur Stanley, Chairman of the Joint War Committee (Red Cross and St. John), and Treasurer of St. Thomas's Hospital, he deprecated any changes which would do away with the individuality of voluntary hospitals. In reply, Sir ARTHUR STANLEY spoke of the success of medical work in the field and the courage of medical officers, and Lord SANDHURST, Treasurer of St. Bartholomew's Hospital, paid a tribute to the way in which the staffs of hospitals at home had worked without stint to supply the place of members serving abroad.

General Sir WILLIAM ROBERTSON, G.C.B., who gave the toast of "The Hunterian Orator," began by saying that he doubted whether the public realized what had been achieved by the medical profession in this war. It was, he said, the one section of the community the Government allowed to do its own work in the war in its own way—a statement much applauded by the audience. How well the work was done, he said, was a matter of history. At the beginning the Army Medical Service had about 3,000 officers and about 25,000 men; those numbers had increased to 14,000 officers and 140,000 men, so that the R.A.M.C. had become larger than the old British Expeditionary Force of 1914. But the work had entailed large sacrifices. The pecuniary sacrifices were not yet at an end, for those who had served so long abroad would not easily re-establish themselves in practice; moreover, at least a thousand medical officers had given not only their work and their prospects, but their lives. The work of the R.A.M.C. had been wonderfully efficient, and Sir Anthony Bowlby, who had gone out to France within a month of the beginning, had a large share in that result; he had seen Sir Anthony Bowlby in those early days going his round in all weathers and circumstances, visiting the dressing posts and casualty clearing stations, serving, through his tact, by his skill, and above all by his humanity, as an essential link between the regular officers and the large number of temporary officers who had come in to make the medical machine efficient.

Sir ANTHONY BOWLBY said that there was no one from whom the medical service was more gratified to receive praise than Sir William Robertson. It must be remembered that the good health of the army was based upon and largely due to the splendid supplies of food and clothing, and for these Sir William Robertson was to be thanked, for he had been the Quartermaster-General at the War Office before the war, and it was as Quartermaster-General that he went to France with the original British Expeditionary Force in August, 1914. That force was one that held a very special place in the minds of the English people. The country was properly proud of the deeds of its navy and army, of the sweeping advances in Mesopotamia and Palestine; of the thrust on the Italian front which broke the foundations of the Austrian line on the Piave; of our splendid leader—Sir Douglas Haig—in France, and of the determination and gallantry of the troops in the great advance which began there on August 8th. But not only was there pride in the feeling towards the old Expeditionary Force of 1914, there were also feelings of gratitude and almost of affection. These men had stood fast at Mons, had turned so fiercely upon their pursuers at Le Cateau that all the heart was taken out of the German advance, had stood in the breach at Ypres and held fast the keys of the Channel Ports. Those deeds were done by the troops of the old "regular army," whose extraordinary skill with the rifle was only equalled by the stoutness of their hearts. But it should be remembered that with these regular troops were a few hundred civilian officers—the only civilian group with this force—the civilian medical officers who had joined as soon as ever war was declared. It was their great good fortune to share in the work of those eventful days, and the Royal College of Surgeons should never forget that its Members and Fellows played their part in the great events of that time. Wars were naturally associated with the making of enemies, but he preferred to remember only the making of friends. Many friendships were made between the civilians and the regulars in all ranks of the armies, and especially, as far as the medical profession was concerned, between the civilian medical officers and those of the army medical service. But the most important friendships of all were those between the Mother Country and the Colonies and United States. Men had come to know each other in camps and billets in a way which was only possible in war. They had learnt more of each other's ways of living, outlook on life, and ideals than could be learnt in a hundred years of peace. However much the army was indebted to the Dominions for fighting men, the medical services were at least equally indebted to them for their work in all medical units. Nothing had ever given him greater satisfaction than the arrangements he had been able to make, in conjunction with Sir Arthur Sloggett and the President, for the battle of Passchendaele. The very best of the Dominion surgeons and of the surgical talent of the United States met and worked there in the most complete harmony with the surgeons of Great Britain, and the thanks of the whole British army were due to them.

The toast of "The President" was given by the LORD MAYOR OF LONDON and acknowledged in a few words by Sir GEORGE MAKINS.

CONFERENCE ON TUBERCULOSIS.

A CONFERENCE of tuberculosis officers from all parts of the United Kingdom, called by the Tuberculosis Society, was held on February 15th, at the house of the Royal Society of Medicine, to consider a scheme for the national prevention and treatment of tuberculosis.

Dr. HALLIDAY SUTHERLAND, who presided, said that since 1914 the death-rate from pulmonary tuberculosis in England and Wales had risen 12 per cent. This proved that existing measures against the disease had failed. Schemes which had seemed admirable in theory had failed in practice, and even broad principles accepted by experts had not been enforced generally throughout the country. Under present conditions the failure of sanatoriums was almost inevitable; there were more patients than beds, and the average period of treatment was not sufficient for cure. The success or failure of the best planned schemes depended, he considered, upon the clinical tuberculosis officer; but the present salaries and prospects of tuberculosis officers were not likely to induce the best qualified men to devote their life to this work. A special tuberculosis service was needed, and the position of tuberculosis officers must be improved.

The conference then proceeded to consider the draft scheme for a tuberculosis service. In its final form—which will be submitted by a deputation to the Prime Minister or to the Minister responsible for the setting up of a Ministry of Health—the scheme advocates the creation of a special department of the Ministry of Health, in England, Scotland, Ireland, and Wales, for the prevention and treatment of tuberculosis. It proposes that the personnel of these departments should include Commissioners for each part of the United Kingdom, advised

by a committee in each country representing medicine, the public health service, local authorities, the Ministry of Pensions, trade unions, friendly societies, and other organizations interested in social welfare. The department of tuberculosis would undertake the following duties:

(*a*) To be responsible for general administrative measures against tuberculosis in the countries concerned.
(*b*) To be responsible for statistics relating to the disease, and to furnish an annual report as to the results of all forms of treatment.
(*c*) To suggest, advise, direct, and if necessary finance, schemes of after-care and employment of tuberculous patients.
(*d*) To direct, finance, and supervise an educational programme.
(*e*) To direct and finance research work in relation to the disease; and
(*f*) To study housing and conditions of work in relation to the incidence of tuberculosis, and to promote legislation dealing with this matter.

The scheme also provides for the appointment of deputy commissioners of tuberculosis, responsible for administrative areas, with tuberculosis officers acting as administrative and supervising clinical officers, and directly advising the local authorities regarding the prevention and treatment of tuberculosis in each district. A tuberculosis officer, it is urged, should have the help of assistants, nurses, and trained health visitors.

MEDICAL MEMBERS OF PARLIAMENT.

DINNER GIVEN BY THE MEDICAL PARLIAMENTARY COMMITTEE.

A DINNER to Dr. Addison, President of the Local Government Board, and to the medical Members of Parliament was given at the Café Royal, on February 12th, by the Medical Parliamentary Committee, Sir WATSON CHEYNE, M.P., presiding. Nine medical members of the new House of Commons were present. Before the toasts were submitted, Dr. ARTHUR LATHAM stated that the Medical Parliamentary Committee was a temporary body formed merely for the purpose of considering how the views of the medical profession on medico-political questions could be placed before the public.

Dr. SQUIRE SPRIGGE, in proposing "The Medical Members of Parliament," dwelt upon the responsibility and opportunity of a man who was at once a member of the medical profession and of the House of Commons. Medical members of Parliament did not go there to represent medicine in the exclusive professional sense; they were members of Parliament first and medical men afterwards.

Dr. ADDISON, in responding, agreed with this definition of the function of a medical member of Parliament, though, on a large view, the public and professional interests were identical. Medical men until lately had been curiously unaware of the political significance either of their own profession or of current events. But it was now becoming clear that, whether they wished it or not, they would have to take a more public part in affairs. The reason why existing bodies did not satisfactorily represent the profession in this public sense was that those bodies had been designed and developed for quite other purposes. Now that the need had arisen, however, he was very hopeful that they would find their way to some working organization. He did not think the medical profession would ever hold one view, and for his own part he hoped it would not. The process would be one of compromise, adjustment, and finally agreement, but an agreement different from the policy of any of the parties who originally started negotiations. The Ministry of Health Bill proposed to set up advisory or consultative councils, and he was determined that these should be a reality. In the absence of one medical organization which could be recognized as speaking for all, it would be the business of his department to ask the different organizations to offer suggestions and advice. Good advice, not the representation of interests, was wanted. He had been asked whether it was possible to substitute "shall" for "may" in that part of the bill which dealt with the establishment of the medical advisory council. But the form of Acts of Parliament was not that of prescription; the form was that "His Majesty may," and as this particular matter related to Orders in Council, it could be taken that if Parliament put in "may" it meant that His Majesty "would." He hoped that all who came in to advise would take a wide view of their functions, and would regard prevention of disease as better than its treatment. Out of this scheme of advisory committees a sort of cabinet of consultation, representing all the different sections, might gradually evolve to give form to the settled health policy for the nation.

Sir BERTRAND DAWSON, in proposing "The Unity of the Profession," said that lack of unity was a characteristic of the profession far back in its history. In *Shakespeare's England* it was stated that in the year 1576 two members were censured by the Court of Barber-Surgeons for using scoffing words and jests at one another; and again, in the year 1577, other members were called to account that they, contrary to order and the good and wholesome rules of the house, misused each other and fought in the fields together. Allowing for certain changes of manners, that might be regarded as an Elizabethan meeting of the profession at Wigmore Hall. On that very recent occasion they found not only two sets of earnest-minded people contending with one another, but a third party intervening in the spirit of the Irishman who inquired whether this was a private quarrel or whether anybody might join in. While the medical profession had not yet learnt the discipline of unity, a situation was developing in which professional unity was urgently needed. But a profession as yet untrained in collective action could not be moulded suddenly into a perfect political cohesion; the conversion must be gradual. Medical men were still in the habit of leaving their organizations for reasons which amazed the politician, who was accustomed every day of his life to the arts of compromise and the reconciliation of differences. A cabinet of politicians had an almost archiepiscopal aptitude for making a negative into a positive, but the profession had not so learned the lesson. He disliked to hear the accusation levelled against any body which was trying to help them in this emergency that its character was unrepresentative, although in the parliamentary sense that might be true. Organizations should not be tested in this case by their constitutional correctness, but by their capacity to do good work. He paid a tribute to the British Medical Association for its foresight in working on the Ministry of Health problem for over a year before the proposals matured, and for bringing into the scope of its conferences other bodies with which it had attained unanimity. He hoped that this work would be continued, and, as he understood, it was the desire of his friends and colleagues who were present that such other bodies should have increasing strength. He hoped that in time the Medical Parliamentary Committee would evolve from a rough and ready and half crystallized organization into a more constitutional and methodical one. The advisory committees would act as a stimulus to cohesion. In them there would be a body of medical men, carefully chosen by the best method possible in the circumstances, and having the right of access to the Minister.

In a brief reply Mr. E. B. TURNER made a strong plea for team work, for unison in the ranks, for willingness on the part of all the different organizations to work together in the spirit of give and take. The unity of the profession was what he had striven for during the eight years since he entered the jungle of medical politics. Colonel HURRY FENWICK, who also responded, expressed the belief that the advisory councils would go far to achieve the unity they desired. Sir JAMES GALLOWAY, who found what he regarded as an unjustifiable depression prevailing among the preceding speakers, instanced the Royal Society of Medicine as an example of fusion which might give encouragement even in the sphere of medical politics. An enlivening speech was delivered by Dr. E. H. STANCOMB, who, in proposing the Chairman's health, made play with the fact that Sir Watson Cheyne had gone from the silent Navy to the "disgraceful Sabbath-breaking of Wigmore Hall," but having got into medical politics he would have to remain in. Great tasks of peace awaited the profession, and medical men should not only give their services to the community, but should awaken in that community a sense of the corporate value of the medical profession.

Sir WATSON CHEYNE was disposed to think that the present unrest and suspicion in the profession was a passing phase due to reaction after the war. He had accepted the chairmanship of the Medical Parliamentary Committee because he found that while it had no political policy of its own to further, it represented all sorts of medical opinion, and was willing to collect and correlate the information of which he and his fellow members in Parliament stood so often in need.

THE hospital of the University of Pennsylvania has resolved that women shall be eligible as internes. The faculty of the School of Medicine of the Western Reserve University has decided to admit women as students next year.

British Medical Journal.

SATURDAY, FEBRUARY 22ND, 1919.

REFRESHER COURSES.

IN a recent article on the overfull medical curriculum it was suggested that a review of the situation led to the conclusion that the curriculum must not only be shortened at the beginning by getting the preliminary sciences taught at the secondary schools, but that it must also be extended after graduation. The term "post-graduate instruction" is not elegant, and has come to be used in a double sense. Originally, and still most commonly, it signifies a scheme affording to those who have been engaged in practice for some years facilities for bringing their general knowledge and practice up to date, or for making themselves acquainted with the theory and practice of a special department. The term has recently been applied to the holding of resident hospital appointments immediately after graduation. It is the ambition of every young medical graduate worth his salt to hold a resident appointment in his own teaching hospital, or failing this in some other general hospital, but its realization is often beyond his reach because there are not enough appointments of this kind to go round. Dr. Addison, in introducing the Ministry of Health Bill last November, said that the Government considered it urgent to arrange that all the services relating to the care and treatment of the sick and infirm should cease to be administered as part of the Poor Law, and should become part of the general health service of the country. We make no doubt that he will be anxious to ensure that the change foreshadowed shall conduce to the improvement of medical education, and that resident appointments in what are now the large city Poor Law infirmaries will be thrown open to graduates from the schools. Other valuable opportunities in this stage are afforded by appointments, some resident, in the special hospitals, and in laboratories perhaps with the help of a research scholarship. If the teaching of the clinical subjects is to be organized on the system outlined in the memorandum of the Board of Education more and better opportunities for practical training on the scientific side will doubtless become open to the young graduate.

But this paulo-post-graduate training—already to a very considerable extent, but not completely, provided in this country—is not what is ordinarily understood by the term post-graduate instruction—namely, the refreshment of knowledge desired by one who has been in independent practice for some years. The distinction is important. The one man has modern instruction but little experience, the other considerable general experience but no modern instruction. The one must extend his training into new departments; the other seeks to make himself acquainted with new knowledge and method in the diagnosis, treatment, and prevention of diseases with which he has long been in practical contact. It is doubtful whether the paulo-post-graduate training needed by the young graduate and the refresher courses for the elder graduate can, with due regard to economy of the time of both sets of graduates, profitably be carried out in the same hospital and with the same staffs.

There are many opinions on the best way of providing what we have for convenience called refresher courses, but we suspect that the plan of a single graduate hospital school will not work in London or any other populous centre. The Royal Commission on University Education in London (1911) recommended that nothing should be done until "Medical Colleges of sufficient size and number to provide for all the university medical students in London had been established." Then, the Commission said, "there would be no objection to organizing a hospital of smaller size as a post-graduate school for the reception, partly of graduates from abroad and the colonies, and partly of students from the other university hospitals who desired to pursue their studies further."

There seem to be two fallacies here. The first is that only from the Dominions and abroad would graduates come to such a school; facilities are desired probably quite as much by graduates at home. The second is that what is wanted is a single hospital. What is wanted is a graduate school organization, and in that respect the emergency scheme of the Fellowship of Medicine seems to be on the right line. A graduate who has been some years in practice wants, as a rule, either to do laboratory work, or to give such time as he has to following some specialty or perhaps the practice and teaching of some individual by whose reputation he is attracted. The memorandum of the Board of Education seems to recognize the truth of this contention for the paulo-post-graduate without, however, stating quite as clearly as would have been desirable its application to the elder graduate.

THE EPIDEMIOLOGY OF PLAGUE.

AN interesting report entitled "Twenty years of plague in India, with special reference to the outbreak of 1917–18," has recently been presented to the Government of India by Major Norman White, C.I.E., I.M.S. In it the history of plague in the several provinces of British India since 1896 is reviewed, and attention specially directed to the relation between plague mortality and humidity, a relation which helps to account for the severe visitation of 1917–18. Major White concludes that, notwithstanding the untoward events of last year, the general trend is in favour of the view that plague is a declining force, probably, he thinks, owing to increasing immunity amongst the rodent population.

Although more general attention has been attracted by experimental work—such, for instance, as the brilliant demonstration by Dr. C. J. Martin and Mr. Bacot of the Lister Institute of the exact mechanism by which the flea infects its host with plague—many additions to our knowledge of the more prosaic but equally important subject of epidemiology have been made during the last ten years. The late Major Lamb was the first to undertake an adequately documented study of the distribution of epidemics and their recurrences in villages. He and Mr. Major Greenwood of the Lister Institute established a differentiation between villages of large size liable to recurrent attacks and smaller villages not so distinguished, and they also effected a regional classification. Subsequently Greenwood provided a statistical proof of the connexion between means of transit and the recurrence of epidemics (a connexion suggested by earlier work), and, from an elaborate analysis of the Punjab evidence, concluded that village plagues were fed by importation from towns; that the chance of infection varied as the size and, in villages of the same

size, as proximity to means of transit, a first requisite of epidemic prevalence being the realization of certain conditions of temperature and humidity; that the severity of the epidemic when engendered depended upon the date of importation and the size of the village, small villages being less likely to become infected, but, if infected, suffering more severely than large ones; and, lastly, that in addition to these general factors, local conditions constant for any one epidemic, but varying from epidemic to epidemic, raised or lowered the mortality rates of contiguous hamlets in a remarkable way. Evidence of greater immunity against plague in rats from severely plague-stricken areas was furnished in a report issued by the Advisory Committee in 1913. The factor of humidity was the object of special study by Majors Gloster and White in a report on the Agra and Oudh plague of 1911–12 which appeared in 1917, and they reached the conclusion that the association of unusual humidity during the winter months in certain districts with severe epidemics was so constant a phenomenon that one might well stand to the other in the relation of cause to effect.

In a paper read before the Epidemiological Section of the Royal Society of Medicine last year, Dr. Brownlee, of the Medical Research Committee, made further contributions to the subject. He showed that the November humidity in many parts of India is, unlike that of this country, highly correlated with the humidity of subsequent months, even with of March, and that the logarithm of the size of the epidemic was linearly related, to a first approximation, with the humidity. Brownlee also called attention to a point not remarked by his predecessors. He found evidence of true periodicity; this he illustrated by the case of Poona, where the period was about 61.5 weeks, with the result that in due course the date of recurrence falls into a season of the year when weather conditions (doubtless those involved in the humidity factor) make a serious epidemic impossible; in such circumstances another outbreak was to be expected when the period again coincided with favourable external conditions. Allied to this true periodicity was a pseudo-periodicity, the epidemic falling later and later in the year until, as before, the external conditions were unfavourable and, unless a throw-back occurred, the disease died out.

From this rapid summary it will be seen that workers attacking the subject from different angles have reached harmonious conclusions, some of which give grounds for optimism, while others should keep that optimism within limits. The concordant findings as to the relation between humidity and plague prevalence should restrain us from reflecting too gloomily upon the events of 1917–18—an exceptionally humid season. The statistics so far available for the last quarter of 1918 show a very remarkable decline even in Bombay and the Bombay presidency. It must be remembered, however, that a similar temporary fall has been noted before, and that there have been months during the last five years when the total plague mortality in Bombay was only 468, and the Central Provinces, Bengal, and Central India were, so far as was known, quite free. The evidence as to the relatively limited numbers of disseminating foci and the part played by means of transit, however, gives ground for hope that, as the standard of education rises and the purpose of sanitary measures becomes better appreciated, administrative action may be more effective. On the other hand, the possible influence of a periodic factor, perhaps representing a phase of the life-history of the organism, is a warning against drawing too confident conclusions from a decline in mortality, such as is, we are glad to say, evident now. For all these reasons the very optimistic forecasts founded on Major White's report by some commentators in this country are too likely to be falsified. He is himself at pains to point out that the decrease in virulence, of which he finds evidence in most of the areas in India severely infected, can in no wise be attributed to increasing efficiency of antiplague measures. He does not make any very definite recommendations on which the Government can act beyond advising it to improve markets and grain stores in towns at present excessively infested by rats and to control movements of grain from and through plague-infected centres.

TAXATION OF WAR SERVICE GRATUITIES AND PENSIONS.

On more than one occasion the Government of the day has had to meet hostile criticism of its proposals with regard to the taxation of the pay issued to officers of the army or navy. From the introduction of the first of the War Budgets to the present time it has been contended that to levy war taxation on men who have given up the emoluments of their civil calling to help their country in a more direct and perilous service was neither necessary nor just; and beginning with the comparatively small concession of a lower rate of taxation to the officer whose total income did not exceed £300, the Government proceeded to institute a new scale of rates of income tax for "service" emoluments which is now markedly below the corresponding "earned income" scale, and to a large measure thereby met—though with a lamentable lack of promptitude—the original unfairness of the uniform application of the increased rates of tax levied for war purposes.

But officers generally have been placed under another disability in the matter of taxation, equally unfair, though, since hitherto it has been of comparative infrequent occurrence, not equally appreciated by the general public or even by intelligent critics of national finance. The ruling of the Income Tax Commissioners that "gratuities" and pensions given for war service are liable to the income tax may have been legally correct, but was demonstrably unfair having regard to the nature of such payments and the reasons for which they are made. The increased importance of this question during the demobilization period has raised so much hostile and enlightened criticism that the method of the importunate widow has once more proved successful, and the Government has publicly stated that the Chancellor of the Exchequer will seek power in the next Finance Bill to regard gratuities made to officers on discharge as free of income tax as from the beginning of the war, and to regard wound and disability pensions as not being liable to taxation as from April 5th, 1918.

The question is, of course, a general one, but that the medical profession is noticeably affected by this change is clear from a parliamentary answer given on the same day as the announcement referred to above was made. In that answer it was stated that since the signing of the Armistice 1,446 doctors had returned to civil life, while another 1,235 had been noted for release, and would return as and when their services could be spared. But there is one phase of this question which especially concerns the medical profession: this is, whether the new rule will apply to the annual gratuities of temporary R.A.M.C. officers as well as to the gratuities paid to Territorial medical

officers on demobilization, who seem clearly to come within the somewhat general terms of the Government statement. We see no reason why these two classes of gratuity should not receive precisely similar treatment, and we trust that the Government will lose no time in making a clear statement on the point.

In dealing with the wound and disability pensions Mr. Baldwin, speaking on behalf of the Chancellor of the Exchequer, made it clear that the ground on which the objection to taxing the pensions had succeeded was that they were in the nature of compensation for injury received and analogous to awards under the Workmen's Compensation Act, which are not taxable, but he did not state the reason for the Government's conversion on the question of the gratuities. His colleague, the Secretary of War, however, in another parliamentary answer, appears to have supplied the omission, when he explained that "the gratuity to regular officers is less than that to temporary officers, because the latter have generally to re-equip themselves for a fresh start in civil life," thereby admitting that the gratuity is, in part if not entirely, paid not as a bonus or addition to income, but as a grant towards the cost of starting or restarting those professional activities on which the future income of the recipient depends. On this ground, and in accordance with the desire to comply with public sentiment to which Mr. Baldwin referred, there can, we suggest, be no doubt but that the relief from taxation should be extended to all gratuities whether paid annually or in a single sum; the time and manner of payment seem to be entirely irrelevant to the merits of the question.

Mr. Baldwin declined to state definitely the precise method by which and the time when the necessary readjustments of the income tax deductions would be made, but hinted that although legislative sanction could not be obtained for some months some attempt would be made to deal with the question departmentally. It may therefore be some time before individual officers will receive any notification of what adjustment will be made in their respective accounts, but we suggest that the Government should immediately consider the desirability of issuing as early as possible a detailed statement of their new proposals and the methods by which they will be carried out, either through the public press or to all individuals who are or may be affected.

THE CLINICAL MEETING OF THE BRITISH MEDICAL ASSOCIATION IN APRIL.

THE names of the large number of distinguished members of the profession who have given their support to the Clinical Meeting of the British Medical Association next April by joining the General Committee are printed in the SUPPLEMENT. The meetings of the three sections—Medicine, Surgery, and Preventive Medicine and Pathology—will be held on the mornings of Wednesday, April 9th, Thursday, April 10th, and Friday, April 11th, in the Imperial College of Science and Technology, which the Rector, Sir Alfred Keogh, has very readily placed at the disposal of the Association. The programme of the sections, which is still subject to revision, is also printed in the SUPPLEMENT. It will be seen that the subjects selected are all of immediate interest and raise civil medical problems upon which the experience gained during the war will throw valuable light. On the second day, for instance, there will be a joint discussion in the Sections of Medicine and Preventive Medicine and Pathology, on influenza, in which the epidemics in France and in England will be compared and the etiology and epidemiology of the disease discussed. In the Section of Medicine there will be, on the first day, a discussion on war neuroses, introduced by Lieut.-Colonel F. W. Mott, and on the third day, on the newer methods in the prognosis of cardio-vascular infections, introduced by Dr. Thomas Lewis, F.R.S. There will also be a discussion on venereal diseases, introduced by Colonel L. W. Harrison, who will in addition give demonstrations at the Military Hospital for Venereal Diseases, Rochester Row. In the Section of Preventive Medicine and Pathology there will be discussions on the dysenteries, introduced by Lieut.-Colonel L. Dudgeon, C.M.G., and on malaria, introduced by Lieut.-Colonel S. P. James, I.M.S., one of the expert officers now employed by the Local Government Board to advise as to the prevention of the disease in this country. In the Section of Surgery the subject of gunshot wounds of the chest will be introduced by Colonel T. R. Elliott, F.R.S., on the medical side, and by Colonel G. E. Gask, C.M.G., on the surgical side. One of the special features of the meeting will be the number of demonstrations, and two of the subjects selected in this Section lend themselves particularly well to this method; the one is wound shock, the theory of which will be discussed by Professor Bayliss, F.R.S., and Dr. H. H. Dale, F.R.S., while demonstrations of methods actually used in France will be given. The other discussion, on reconstructive surgery, to be introduced by Major R. C. Elmslie, will be illustrated by a series of demonstrations at the Military (Orthopaedic) Hospital, Shepherd's Bush, and elsewhere. At the Royal College of Surgeons of England three special demonstrations of the War Collection will be given, the first by the President of the College, Sir George Makins, G.C.M.G., on injuries of arteries; the second, by Professor Arthur Keith, F.R.S., on fractures of the skull; and the third, by Mr. Cuthbert Wallace, C.B., C.M.G., on abdominal injuries. On the evening of Tuesday, April 8th, a conversazione, arranged by the Metropolitan Counties Branch, will be held in the Guildhall of the City of London, kindly lent for the occasion by the Lord Mayor. Those attending will be received by the President of the British Medical Association, Sir Clifford Allbutt, K.C.B., F.R.S. On the evening of Wednesday, April 9th, the Royal Society of Medicine will give an "at home" at which members will be received by the president of the society, Sir Humphry D. Rolleston, K.C.B. On Thursday there will be a dinner at the Connaught Rooms. The success of the meeting seems to be assured so far as interesting scientific work and agreeable social opportunities for making or renewing friendships are concerned. The only difficulty will be the matter of accommodation for visitors. Hotels in London are, and have been for some months, very full, and members proposing to attend the meeting are advised to make early arrangements. It is desirable to secure accommodation at once, and it may be necessary to pay a deposit at the time of ordering rooms. A certain amount of private hospitality will, it is anticipated, be offered.

UNIVERSITY HOSPITAL SCHOOLS FOR LONDON.

IT seems probable that we are about to see changes in the machinery of medical education, especially in London, which it is believed will increase the scientific character of the teaching in clinical subjects. The Royal Commission on University Education in London recommended the creation of university medical schools, and suggested three such schools, each having at least three whole-time professors in the three main subjects—medicine, surgery, and obstetrics—with, in addition, when circumstances made it appropriate, chairs in special subjects, such as pediatrics, neurology, psychiatry, and so on. A whole-time professor would be at the head of a "hospital unit," would have the control of wards, and of an out-patient department; he would be provided with assistants nominated by him, to assist him in carrying on the research, and would have laboratory accommodation in close proximity

to the wards not only for the service of the wards but also for research. The assistants would also be engaged in teaching, and it was contemplated that members of the profession in active practice should be invited to co-operate. The scheme was to a large extent imitative, and was clearly influenced not only by the method of German universities, but also by the movement which eventually resulted in the appointment of whole-time professors in the Johns Hopkins Hospital, Baltimore. It was feared that if the imitation were too slavish, the essentially practical clinical training in English schools, which has made the English doctor a better man than the German, would be lost, but the Board of Education, which is now taking a definite interest in the matter, seems to be fully aware of this danger. That Board already, as is well known, makes grants to the majority of medical schools, and it is understood to be willing to increase these grants on condition that any scheme adopted shall provide for the appointment and adequate remuneration of professors of clinical medicine, surgery, and obstetrics, and, where advisable, of other subjects, who would devote the greater part of their time to teaching and research. While it would not be advisable wholly to debar such a professor from private practice—success in which is a valuable asset in teaching work—he should be prepared, so long as he continues to be the head of a clinical department, to be primarily a teacher, and only in a minor degree a practising consultant; that is to say, his first and predominant interest would be the university. The Board in its memorandum suggested that the professors should have the control of wards (50 to 100 beds) and an out-patient department, and ample laboratory accommodation for research in clinical pathology, including cardio-respiratory work, bacteriology, microscopy, and *x*-ray and electrical work. Another condition was that the professors should have an adequate staff of teachers and assistants of university status, properly paid and graded, consisting of men, some whole-time and some part-time engaged in practice, sufficient in number to permit of small clinics and the representation of the various branches of medicine or surgery, all of which cannot be taught by a single professor. Finally it was laid down that an appropriate arrangement must provide for the close and integral association of the laboratory method with the clinical method, and for the full exercise of the two great branches of clinical teaching which Great Britain has taught to the world—the hospital bedside teaching system and the clinical lecture-demonstration of university standard. We understand that proposals on these lines have been made by the Board, and that they are under the serious consideration of four of the chief medical schools in London. Similar proposals have been made to the provincial universities, where, however, the need for reorganization is perhaps less urgent.

FILTER-PASSING VIRUS.

IN their preliminary report on the presence of a filter-passing virus in certain diseases, published in our columns on February 1st, Bradford, Bashford, and Wilson stated that they had made investigations resulting in the detection, isolation, and culture by the Noguchi method of an organism from cases of acute infective polyneuritis which produced the malady when inoculated into animals. They gave particulars showing that the same method had revealed the presence of a comparable virus in trench fever, influenza, and nephritis, and added that organisms differing from one another but belonging to the same group had been recovered by culture in mumps, measles, rose measles, and typhus. The full text of the paper by these authors on acute infective polyneuritis has now been published.[1] Sir John Rose Bradford gives a detailed description of the clinical phenomena of acute febrile polyneuritis in man. There is often a history of an initial illness of a mild type, accompanied by headache and pain in the back, and a rise of temperature to 100° or 101° F. Then follows a period of latency of variable duration, up to a month or even six weeks. The fully declared or paralytic stage of the disease often develops suddenly; weakness in the legs is usually the first complaint, and a man may fall down on parade or even on the march, although still able to stand or even to walk with assistance. A characteristic feature is the marked degree in which the palsy affects the proximal segments of the limb. It is common to observe that the movements of the shoulder and hip are extremely weak or absent at a time when the patient can still move the fingers or toes freely. Though a group of large muscles, such as those of the hip, may be more affected than other muscles, the palsy never picks out individual muscles and is never limited even to a group of muscles. The muscles of the back, abdomen, chest, and neck are prone to be affected in all the more severe cases, so that the patients are not only unable to raise themselves, or sit up in bed, but cannot turn in bed, and often cannot raise their heads from the pillow. Facial paresis, usually bilateral, is characteristic and rarely absent. Paralysis affecting the oculomotor nerves is rare. Muscular wasting occurs only in severe and long-lasting cases. The sensory apparatus is disturbed, as indicated by pain at first and numbness and tingling in the palsied parts later. The disease seems to attack generally young men, but there was one case as old as 49. It is a fatal disease, since of the 30 cases upon which the paper is founded eight died. In two cases death took place on the fifth day, in one on the sixth, in one on the eighth, in one on the eleventh, and in one on the twentieth. Death appears to be usually brought about by respiratory embarrassment and pulmonary complications, due to palsy of the respiratory muscles, both the intercostals and the diaphragm being frequently affected. Bradford concludes that the disease is a very definite entity, due to a diffuse affection of the nervous system affecting the spinal cord, spinal ganglia, and peripheral nerves, with but slight incidence on the cortex. Bashford describes the morbid anatomy of the disease in man and in the monkey, and records its experimental production in the monkey. He amplifies the details given by Gordon Holmes in this JOURNAL (July 14th, 1917, p. 37), and adds a number of new observations. He found a gradually ascending involvement of the grey matter of the entire nervous system, the appearances pointing to a systemic poison which entered the central nervous system by way of the nerve trunks, both motor and sensory. The nature of the virus is described by Wilson in a paper which may be commended as a model of clear and precise statement, so excellently expressed as to make the details easily comprehensible to the non-expert. He isolated an organism of definite microscopical and cultural characters, cultivated it, and reproduced the disease by subdural inoculation in a monkey. The method of cultivation is described, and the results illustrated in some excellent coloured drawings by Mr. A. K. Maxwell. The method is as follows: A fragment, about the size of a pea, of sterile guinea-pig kidney is placed at the bottom of a sterile test tube, and alongside it a fragment of a similar size of the nervous tissue from the suspected case. The fragments are covered with a small quantity of a special serum agar. When this is set a special serum bouillon is added, the whole sealed with a moderately thick layer of vaseline, and the tube kept at 37° C. On the fourth or fifth day a granular haze appears in the vicinity of the nervous tissue, and about the seventh day minute semi-translucent colonies are seen on the surface of the agar, and grow rapidly. The surface colonies assume a faint yellow colour, and their upper limits become irregular. All the features are reproduced in subcultures, but the growth becomes more scanty in successive generations. No strain has been carried beyond the fifth generation, so that it would

[1] *The Quarterly Journal of Medicine*, vol. xii, Nos. 45 and 46, October, 1918, and January, 1919.

appear that the organism, which is an anaërobe, possesses feeble saprophytic powers. In stained specimens of cultures from five to ten days old it appears as a minute rounded, oval or kidney-shaped body, measuring 0.2 to 0.5 μ in diameter and presenting a darkly-stained rounded spot, eccentrically placed, surrounded by a narrow faintly-stained area. As the cultures become older the organisms, which are grouped in colonies, swell up, lose their selective staining, and become indefinite in outline. The general resemblance to the globoid body of poliomyelitis is discussed, but the two organisms are shown to be distinct. These observations on acute infective polyneuritis and those on the other diseases mentioned in the preliminary report published on February 1st afford much material for speculation, but Sir John Rose Bradford does not go further than to point out that the facts suggest that the virus of poliomyelitis instead of being an isolated and peculiar thing, is one member of a class of organisms which await further study. We may share Dr. Bashford's hope that a new impetus has been given to the investigation of much that still remains obscure in the diseases of the nervous system, and not only in them, but of some general infections the etiology of which has hitherto evaded investigation.

DYSENTERY PATIENTS, CONVALESCENTS, AND CARRIERS.

AN Army Council Instruction, No. 78 of 1919, dated February 1st, gives in detail the procedure to be adopted in Home Commands with regard to the treatment and disposal of convalescents from dysentery. All patients suffering or convalescent from dysentery, whether contracted in the United Kingdom or whilst serving in an Expeditionary Force, will, if fit to travel, be sent to one of thirteen selected dysentery hospitals, where they will be examined, treated, and disposed of as directed. The central dysentery hospital at Addington Park, Croydon, will provide both for the completion of convalescence, and also for the special treatment of carriers and chronic cases; it will be known as the Addington Park Military Hospital. Ordinary patients and carriers and certain cases of severe and relapsing dysentery will ultimately be transferred to the central hospital from the other twelve selected hospitals. Each of these, it is laid down, should have on its staff a competent bacteriologist and protozoologist, the laboratory in which the diagnostic work is done being either in the hospital itself or in very close proximity to it. The dysentery cases should be in charge of medical officers specially selected for their experience of, or aptitude for, the work, and as few changes as possible should be made in these appointments. Close collaboration between the clinical and laboratory staffs is regarded as of the utmost importance. Precise instructions are given for the classification and disposal of cases of bacillary and amoebic dysentery. The latter will undergo a course of specific treatment as laid down in the instructions drawn up by the War Office Committee on Dysentery. "Clinical dysentery" is recognized as a diagnosis for cases in which the specific organism cannot be demonstrated, but in which the clinical evidence is considered clear. Bacillary carriers are divided into "temporary" and "chronic." In no case should a chronic bacillary carrier be allowed to join, or rejoin, a force serving overseas. Cases classified as uncured or healthy amoebic carriers will be dealt with on the principle that specific treatment, or re-treatment, is optional, the medical officer in charge explaining fully the position to the patient, who, if he elects to be discharged while still a carrier, will be required to sign a paper stating that his condition has been explained to him, and that he has been offered and has refused a course of specific treatment. The Local Government Board will be informed of the discharge from hospital of any uncured or chronic case of dysentery (amoebic or bacillary), and any bacillary carrier. The Local Government Board, as was noted last week, made an order, dated January 7th, 1919, making it compulsory for a medical practitioner to notify any case of dysentery (among other diseases) which he is attending professionally. The medical officer of health on becoming aware of a case of dysentery in his district is to investigate the source of the infection and take steps to prevent its spread, including, if necessary, the treatment of the patient in a suitable hospital, and to inform the Local Government Board. Further, he is empowered, if necessary, to notify the person in writing that he shall discontinue any occupation connected with the preparation or handling of food or drink for human consumption, to forbid children in the care of any such person to be sent to school, and to specify measures that must be taken with respect to cleansing, disinfection, disposal of excreta, destruction of flies, and prevention of contamination of articles of food or drink for human consumption. The M.O.H. is also empowered to give notice to the responsible manager of a business concerned with the preparation or handling of food or drink that a person employed is suspected to be a dysentery carrier, and if the suspicion is confirmed by bacteriological or protozoological examination, the M.O.H. may give notice to the manager and to the person to prevent, during a specified period, the employment of such person in the conduct of that business, or any other business concerned with the preparation or handling of food or drink for human consumption.

THE RECRUDESCENCE OF INFLUENZA.

THE surmise ventured in our last issue, that a third wave of epidemic influenza was gathering head, is unfortunately confirmed by the latest available figures. In London the smallest number of deaths attributed to influenza in any week after the beginning of the late outbreak was 33, in the week ending January 25th. In the two following weeks the numbers were 58 and 100, while for the week ending February 15th the return is 273, which has not been exceeded since December 14th. If we assume for the moment that that week (February 15th) corresponds to the week ending October 19th in its place in the cycle of epidemic evolution (in the week ending October 19th the deaths from influenza rose to 371 from 80 in the previous week), we should have reason to suppose that the third wave, although likely to cause a large number of deaths, would not reach the height of the autumn tide. Thus the autumn figures were 80, 371, 1,256, 2,458, 2,433, 1,665, 1,173, 942, 660, 332, 186, 95, 65, the last figure relating to the week ending January 4th. If, now, we express the series as percentages of the first item (the 80 deaths in the week ending October 12th), we have 100, 464, 1,570, 3,073, 3,041, 2,081, 1,473, 1,178, 825, 403, 233, 119, 81. The percentage ratio of 273 to 100 is 273, and, were the successive ratios reduced in the same proportion, we ought to have for the present series the above figures multiplied by $\frac{273}{464}$—that is, the gross mortality of the epidemic would be 100, 273, 924, 1,808, 1,789, 1,224, 867, 693, 485, 237, 137, 70, 48, or, say, about 70 per cent. of the previous mortality. It is, however, hazardous in the extreme to make predictions of this kind, and we merely desire to point out that the present indications, although warranting caution, do not justify the alarmist attitude which, we fear, sensational articles in lay journals tend to foster. The figures for the great towns show that the wave is affecting the country as a whole, but so far the prevalence to the north of the Trent seems greater than to the south of it. The influenza figures for Scotland have not been published weekly, but we notice that the deaths from pneumonia, bronchitis, and pleurisy in the sixteen towns of Scotland for which returns are published were 275 in the week ending January 25th, 307 in the following week, and 425 in the week ending February 8th. We would remark that in drawing deductions from the death returns for respiratory affections allowance ought to be

made for the meteorological factors, so that the whole of the excess mortality must not be credited to the reigning epidemic.

THE MEDICAL WORK OF THE MINISTRY OF NATIONAL SERVICE.

WE have received the following announcement for publication: It has been agreed by the Ministers that the medical side of the Ministry of National Service shall be transferred to the Ministry of Pensions. Arrangements are now in progress to effect this transfer. The medical and secretarial staffs affected by this arrangement are at the head quarters of the Ministry of National Service and at the offices of regions and areas of the Ministry. They will continue to carry out their duties as at present under the current instructions of the Ministry of National Service. These officials will receive notice in due course of time of the arrangements proposed for their transfer. The only officers not affected by the transfer are the Chief Commissioner of Medical Services and the branch (M 4) dealing with demobilization of medical and dental officers on service with the armed forces of the Crown. These will remain as at present in the Ministry of National Service.

A COMMONS MEDICAL COMMITTEE.

A House of Commons Medical Committee has been formed to include all medical members and other members of the House of Commons interested in scientific matters akin to medicine. All the medical members, excepting the Ministers, have joined, and also Sir Philip Magnus (member for the University of London) and Sir Henry Craik (one of the members for the Scottish Universities). The chairman is Sir Watson Cheyne, and the secretary Major A. C. Farquharson, R.A.M.C. The executive committee consists of Sir William Whitla, Lieut.-Colonel Nathan Raw, R.A.M.C., and Captain Elliott, R.A.M.C. The objects of the committee are to exchange opinions so as to secure representation of agreed views on medical subjects in Parliament. The committee is open to receive representations on all such matters from the colleges and corporations, and from societies and associations, and will hold conferences when considered desirable. It will not allow itself in any way to be identified with any one particular body. The committee is to have a conference with Dr. Addison as to the Ministry of Health Bill on Monday. It has appointed a subcommittee, consisting of Colonel Nathan Raw (England), Sir Watson Cheyne (Scotland), and Sir William Whitla (Ireland), to watch the bill in its progress through the House.

THE King has been graciously pleased to approve of the appointment of Field-Marshal His Royal Highness Arthur W. P. A. Duke of Connaught and Strathearn, K.G., K.T., K.P., G.C.B., G.C.S.I., G.C.M.G., G.C.I.E., G.C.V.O., G.B.E., as Colonel in Chief of the Royal Army Medical Corps.

WE regret to record the death, in his 57th year, of Lieut.-Colonel A. M. Paterson, Professor of Anatomy in the University of Liverpool, who had held the office of Assistant Inspector of Military Orthopaedics for several years. We hope to publish a short biography in an early issue.

AT the meeting of the governors of Westminster Hospital on February 18th it was decided that the question of amalgamation with another hospital should be referred to the decision of arbitrators to be appointed by King Edward's Hospital Fund for London. It seems now very probable that, should the arbitration result in recommending amalgamation, this will take place with King's College Hospital.

COLONEL A. BERTRAM SOLTAU, C.M.G., M.D., who is about to resume his duties as physician to the South Devon and East Cornwall Hospital, Plymouth, has accepted the invitation of the Minister of Pensions to act as honorary consultant to the Ministry on the effects of warfare gas poisoning and the after-care of officers and men suffering from gas poisoning. Colonel Soltau, who went to France in 1914 in command of a Territorial field ambulance, has been a consultant physician to the forces since 1916, and has had special experience in the treatment of gassed cases.

DR. ADDISON, President of the Local Government Board, has appointed Sir George Newman, K.C.B., M.D., F.R.C.P., Principal Medical Officer of the Board. Sir George Newman will for the present retain his position as Chief Medical Officer of the Board of Education and Medical Assessor to the Universities Branch of that Board. The arrangement whereby Sir George Newman undertakes for the present the duties of chief medical officer in both departments indicates a step towards the co-ordination of the public medical services which will be one of the principal objects of the Ministry of Health. The post of Principal Medical Officer to the Local Government Board is a new post. The holder will have the status of a Secretary of the Board, and will have administrative responsibilities in respect of the work of his department.

Medical Notes in Parliament.

Ministry of Health.

THE Ministry of Health Bill was introduced by Dr. Addison, with the support of Mr. Fisher, Mr. Munro, and Major Astor, on February 17th. The text is nearly identical with that of the measure introduced last November. Sub-clause 3 of Clause 3, relating to the transfer of powers to and from the Minister, has been made wider, and provides that any powers and duties of the Minister other than those enumerated in the first schedule may be transferred to another Government department if they appear to relate to matters affecting or incidental to the health of the people. The following explanatory paragraph is inserted relating to the Poor Law:

> And it is hereby declared that it is the intention of this Act that, in the event of provision being made by Act of Parliament passed in the present or in any future session for the revision of the law relating to the relief of the poor and the distribution amongst other authorities of the powers exercisable by boards of guardians, there shall be transferred from the Minister to other Government departments such of the powers and duties under the enactments relating to the relief of the poor then vested in the Minister (not being powers or duties relating or incidental to the health of the people) as appear to His Majesty to be such as could be more conveniently exercised and performed by such other departments.

The After-care of Tuberculous ex-Service Men.—In answer to Mr. Pennefather, Sir James Craig, on February 13th, said that an expenditure of £20,000 a year on the after-care of tuberculous ex-service men was sanctioned in May, 1918, and a scheme for domiciliary visits was considered in consultation between the Ministry of Pensions, the Local Government Board, and the Insurance Commission. On December 4th the Local Government Board issued an explanatory circular to the local authorities. Special appointments would not be necessary in all areas as the scheme was an extension of the arrangements which in many districts were already in existence. In the debate on the address on February 14th, Lieut.-Colonel Nathan Raw said that it was estimated that there were between 40,000 and 50,000 soldiers and sailors affected with tuberculosis, a large proportion of whom had contracted the disease owing to the rigors of active service. The Government had been sympathetic, but a few months in a sanatorium and payment of a pension was not sufficient to cure tuberculosis, and a more comprehensive scheme was required. He appealed to the Government to appoint a special committee to deal with tuberculosis as it affected men invalided from the services and to establish some general form of adequate treatment which could be immediately put into effect. He suggested the formation of a department under the Health Ministry, concerned solely with the treatment of tuberculosis, to provide the necessary colonies and open-air methods. Ex-service men should not be passed on to the local authorities; special pro-

vision should be made for them. Sir Kingsley Wood said that at the present time there were in London about 2,500 soldiers who were receiving no treatment, and every week there were several hundreds of men waiting to go into sanatoriums. He severely criticized the administration of some of these institutions. Sir James Craig, Parliamentary Secretary to the Ministry of Pensions, said that disabled men received priority over other cases of tuberculosis, the accommodation in institutions was to be increased, after-care and home treatment improved, treatment of early cases extended, and steps taken to find for the men who did well graduated employment in agriculture and other suitable industries.

Artificial Limbs.—Sir James Craig stated, on February 13th, that the Minister of Pensions had appointed a committee to report on the existing arrangements with regard to supply, fitting, repair, and refitting of artificial limbs, and whether the Ministry should provide one or more institutions for the supply and repair of limbs, and should employ therein partially disabled or limbless men. The Committee consisted of Mr. Herbert Guedalla (Chairman), Brigadier-General G. H. Cockerill, C.B., and Captain Albert Smith, who had consented to act with Sir Charles Kenderdine and a leading surgeon, subsequently announced to be Mr. Raymond Johnson, O.B.E., F.R.C.S., Holme Lecturer in Clinical Surgery, University College Hospital. The number of men whose stumps were healed awaiting the fitting of artificial limbs on February 1st was 2,832, and the number of men whose stumps were not sufficiently healed for fitting was 5,321. Arrangements for the repair of artificial limbs were now being made by the local committees, and appeared to be working well. Limbs were supplied also to officers. There would not be any general provision of spare limbs until the arrears of first limbs had been worked off. In urgent cases, such as those of men going abroad or of men in special need by reason of their particular occupation, spare limbs had been provided. When asked subsequently the reason why so large a number as 2,832 men whose stumps were healed were still awaiting the fitting of artificial limbs, Sir James Craig replied that the rate of progress in fitting artificial limbs was governed by the limits of accommodation in the fitting hospitals and by the output of limbs by the limb makers. The number of men on the waiting list was large, but it represented what was now a normal two months for the fitting hospitals. The question of delay would be examined by the committee already announced.

The Search for Missing Soldiers.—Mr. Churchill stated in writing, on February 13th, that the present net total of officers and men reported "missing," including prisoners of war for all theatres and all services (Imperial and Colonial), was approximately 359,800. Of this total it was estimated that about 198,000 had been made prisoners. Death was presumed in the case of about 97,000 owing to the absence for a long period of an indication that they were alive; hence there were about 64,800 whose fate remained to be determined. Medical units, fully staffed and equipped, had been sent into each army corps district in Germany with orders to search every camp, prison, mine, asylum, hospital, and elsewhere. The sick were concentrated in central hospitals in each army corps district and moved from there in hospital train. Other Allied powers undertook the same service, and each collected all of any Allied nationality. The German authorities called for a complete roll of all Allied prisoners still in the country on January 25th, with heavy penalties against non-disclosure. A list of those who were known to be prisoners of war and who had not yet been repatriated or whose death had not been reported officially was in preparation. It would be presented to the German Government with demand that they should account for every one of them. A central inquiry office under British supervision would be established at Frankfort. It was possible that a certain number of men might elect to stay in the country and not make their presence known.

Training Statistics.—Asked by Mr. Pennefather, on February 17th, why only 7,939 men are now in training under the Pensions Warrant, Sir James Craig said that the large majority of disabled men were either ineligible for training in that they could resume their pre-enlistment occupations, or did not seek training because they had accepted unskilled and probably well-paid employment. The number of men awaiting training was approximately 1,500. Of this number 885 desired to take up electrical or mechanical engineering, training for which was suspended pending certain negotiations with the National Trade Advisory Committee. Of the remainder a large proportion wished to be trained in boot and shoe making and repairing, but as there was a limit to the absorbing capacity of this trade an endeavour was made when possible to induce the man to take up some other form of training.

The War Bonus to Panel Doctors.—In a written answer to Sir Kingsley Wood, Mr. Pratt, for the National Insurance Commissioners, on February 17th, stated that early in last year the Chancellor of the Exchequer received a deputation of insurance practitioners and promised them a supplementary remuneration in respect of the increased cost of living and practice in certain cases. The total cost could not be accurately estimated until all cases had been dealt with, but it was not expected to exceed £250,000. It would be paid under the statutory authority of the Appropriation Act from Exchequer moneys voted by Parliament for the purpose, supplementing the Exchequer moneys, approximating to some two million pounds annually, expended on medical remuneration apart from the funds derived from insurance contributions.

THE WAR.

CASUALTIES IN THE MEDICAL SERVICES.

ARMY.

Died on Service.

CAPTAIN J. S. COCKS, R.A.M.C.(S.R.).

Captain John Stanley Cocks, R.A.M.C.(S.R.), was reported as having died on service, in the casualty list published on February 10th. He was educated at Guy's Hospital, and took the diplomas of L.D.S. R.C.S.Eng. in 1912, and of M.R.C.S. and L.R.C.P.Lond. in 1914. He took a commission as lieutenant in the Special Reserve of the R.A.M.C. on October 7th, 1914, and was promoted to captain on April 7th, 1915.

LIEUTENANT F. P. M. LUET, A.A.M.C.

Lieutenant F. P. M. Luet, Australian Army Medical Corps, was returned as having died on service, in the casualty list published on February 14th.

HONOURS.

A SPECIAL Supplement to the *London Gazette*, dated February 15th, contains a further list of awards in recognition of "gallantry and devotion to duty in the field." The following medical officers are included:

Bar to D.S.O.

Major (temporary Lieut.-Colonel) Francis Cornelius Sampson, D.S.O., 91st Field Ambulance, R.A.M.C. (D.S.O. gazetted January 14th, 1916.)

Captain (acting Lieut.-Colonel) James Henry Fletcher, D.S.O., M.C., R.A.M.C., commanding 36th Field Ambulance. (D.S.O. gazetted July 18th, 1917.)

D.S.O.

Lieut.-Colonel Stanley Paulin, 11th Field Ambulance, C.A.M.C.

Major Leonard May, M.C., A.A.M.C., attached 11th Battalion, Australian Infantry.

Temporary Major Charles Fraser Knight, 133rd Field Ambulance, R.A.M.C.

Captain Patrick Augustine Ardagh, M.C., N.Z.M.C., attached 1st Battalion, Auckland Regiment.

Second Bar to Military Cross.

Temporary Captain (acting Major) Maurice Aloysius Power, M.C., R.A.M.C., attached 148th Field Ambulance. (M.C. gazetted January 18th, 1918. First bar gazetted January 11th, 1919.)

Temporary Captain George Oliver Fairclough Alley, M.C., R.A.M.C., attached 2nd Battalion, Royal Irish Regiment. (M.C. gazetted June 4th, 1917. First bar gazetted September 16th, 1918.)

Lieutenant (temporary Captain) William John Knight, M.C., R.A.M.C., attached 89th Field Ambulance. (M.C. gazetted May 31st, 1916. First bar gazetted February 18th, 1918.)

Bar to Military Cross.

Captain (temporary Major) Robert Alexander Hepple, M.C., R.A.M.C.(S.R.), attached 28th Field Ambulance. (M.C. gazetted July 26th, 1918.)

Captain (acting Major) John Bernard Cavenagh, M.C., R.A.M.C.(S.R.), attached 113th Field Ambulance. (M.C. gazetted September 17th, 1917.)

Captain (acting Major) Thomas Frederick Corkhill, M.C., R.A.M.C.(S.R.), attached 139th Field Ambulance. (M.C. gazetted September 26th, 1917.)

Captain (acting Major) Frederick Gamm, M.C., R.A.M.C. (S.R.), attached 2/3rd (Home Counties) Field Ambulance R.A.M.C.(T.F.). (M.C. gazetted July 26th, 1918.)

Captain (acting Major) William Clavering Hartill, M.C., 55th Field Ambulance R.A.M.C. (M.C. gazetted January 1st, 1917.)

Captain (acting Major) William Archibald Miller, D.S.O., M.C., R.A.M.C.(S.R.), attached No. 6 Field Ambulance. (M.C. gazetted November 14th, 1916.)

Captain (acting Major) James Calvert Spence, M.C., R.A.M.C. (S.R.), attached 34th Field Ambulance. (M.C. gazetted September 17th, 1917.)

Captain Franklin Fletcher Dunham, M.C., C.A.M.C., attached No. 5 Field Ambulance. (M.C. gazetted October 18th, 1917.)

Captain John Shaw Mackay, M.C., 12th Field Ambulance, A.A.M.C. (M.C. gazetted January 18th, 1918.)

Captain Laurel Cole Parker, M.C., 13th Field Ambulance, C.A.M.C. (M.C. gazetted February 1st, 1919.)

Captain Joseph Gregor Shaw, M.C., 12th Field Ambulance, C.A.M.C. (M.C. gazetted February 1st, 1919.)

Captain Donald George Kennedy Turnbull, M.C., 11th Field Ambulance, C.A.M.C. (M.C. gazetted July 26th, 1917.)

Temporary Captain (acting Major) John Edgar Davies, M.C., 131st Field Ambulance, R.A.M.C. (M.C. gazetted September 18th, 1918.)

Temporary Captain (acting Major) Benjamin Knowles, M.C., R.A.M.C., attached 88th Field Ambulance, R.A.M.C.(T.F.). (M.C. gazetted March 26th, 1918.)

Temporary Captain (acting Major) Harold Dunmore Lane, M.C., R.A.M.C., attached 1/1st North Midland Field Ambulance, R.A.M.C.(T.F.). (M.C. gazetted October 18th, 1917.)

Temporary Captain Frederick Orlando Clarke, M.C., R.A.M.C., attached 149th Field Ambulance. (M.C. gazetted January 11th, 1919.)

Temporary Captain Claude Norman Coad, M.C., 74th Field Ambulance, R.A.M.C. (M.C. gazetted July 26th, 1917.)

Temporary Captain Alexander Campbell White Knox, M.C., R.A.M.C., attached 2nd Battalion, Royal Sussex Regiment. (M.C. gazetted January 1st, 1918.)

Temporary Captain James David MacKinnon, M.C., R.A.M.C., attached 4th Battalion, Liverpool Regiment. (M.C. gazetted September 16th, 1918.)

Military Cross.

Captain (acting Major) Hubert Roy Dive, 1/2nd Mounted Brigade Field Ambulance, R.A.M.C., attached 230th Field Ambulance.

Captain (acting Major) Arthur Leonard Shearwood, R.A.M.C. (S.R.), attached 33rd Field Ambulance.

Captain Alan Fenton Argue, C.A.M.C., attached 87th Canadian Battalion, Quebec Regiment.

Captain Frederick Grant Banting, 15th Field Ambulance, C.A.M.C.

Captain James Harold Blair, C.A.M.C., attached 72nd British Columbia Regiment.

Captain Edwin John Bradley, R.A.M.C.(S.R.), attached 1/3rd North Midland Field Ambulance, R.A.M.C.(T.F.).

Captain Miles Gillespie Brown, C.A.M.C., attached 85th Canadian Battalion, Nova Scotia Regiment.

Captain Edwin Thomas Cato, A.A.M.C., attached 1st Battalion, Australian Infantry.

Captain Herbert Troughton Chatfield, R.A.M.C.(S.R.), attached No. 6 Field Ambulance.

Captain Lewis Hayes Fraser, C.A.M.C., attached Royal Canadian Horse Artillery.

Captain Gerald Wallace Grant, No. 4 Field Ambulance, C.A.M.C.

Captain Albert Robert Hagerman, C.A.M.C., attached 78th Canadian Battalion, Manitoba Regiment.

Captain James Mann Henderson, A.A.M.C., attached 12th Battalion, Australian Infantry.

Captain Charles Terrell Lewis, C.A.M.C., attached 10th Brigade, Canadian Field Artillery.

Captain Iorworth Hubert Lloyd-Williams, R.A.M.C.(T.F.), attached 5th Battalion, Lincoln Regiment (T.F.).

Captain Harry Clarke Moses, C.A.M.C., attached No. 5 Field Ambulance.

Captain John Archibald Nicholson, R.A.M.C.(S.R.), attached 1st Battalion, Seaforth Highlanders (Egypt).

Captain Kenneth Claud Purnell, A.A.M.C., attached 11th Brigade, Australian Field Artillery.

Captain Allan Melrose Purves, A.A.M.C., attached 2nd Tunnelling Company, Australian Engineers.

Captain George Alexander Smith, C.A.M.C., attached 47th Canadian Battalion, West Ontario Regiment.

Captain Clifford Halliday Kerr Smith, R.A.M.C.(T.F.), attached 1/4th Battalion, King's Own Scottish Borderers (T.F.).

Captain John Stirling, R.A.M.C.(S.R.), attached Head Quarters, 112th Brigade, Royal Field Artillery.

Captain Joseph Townsend Stirling, 11th Field Ambulance, C.A.M.C.

Captain Richard Chapman Weldon, C.A.M.C., attached 2nd Canadian M.G. Brigade.

Temporary Captain (acting Major) John Richard Percy Allin, 90th Field Ambulance, R.A.M.C.

Temporary Captain (acting Major) Basil William Armstrong, R.A.M.C., attached 100th Field Ambulance.

Temporary Captain Thomas Clapperton, 141st Field Ambulance, R.A.M.C.

Temporary Captain Robert Donald, R.A.M.C., attached 35th Field Ambulance.

Temporary Captain Alexander John D'Souza, I.M.S., attached 92nd Punjabis (Egypt).

Temporary Captain William Balfour Gourlay, R.A.M.C., (N. Russia).

Temporary Captain Norman Frankish Graham, R.A.M.C., attached 6th Battalion, London Regiment.

Temporary Captain Richard Perrott Hadden, 103rd Field Ambulance, R.A.M.C., attached 152nd Brigade, Royal Field Artillery.

Temporary Captain Alexander Hunter, R.A.M.C., attached 63rd Divisional Engineers.

Temporary Captain William Boyd Jack, R.A.M.C., attached 5th Battalion, Leicester Regiment (T.F.).

Temporary Captain Matthew James Johnston, R.A.M.C.

Temporary Captain Charles William Berry Littlejohn, 140th Field Ambulance, R.A.M.C.

Temporary Captain Alfred Mason, R.A.M.C., attached 229th Field Ambulance.

Temporary Captain Edward Rogerson, R.A.M.C., attached 2nd Battalion, King's Royal Rifle Corps.

Temporary Captain James Scott, R.A.M.C., attached 12th Battalion, Manchester Regiment.

Temporary Captain Thomas McCall Sellar, R.A.M.C., attached 1/18th London Regiment.

Temporary Captain George Burkett Wilkinson, 28th Field Ambulance, R.A.M.C.

Lieutenant William Percival Nelson, R.A.M.C.(S.R.), attached 1/28th Battalion, London Regiment.

EAST AFRICAN CAMPAIGN.

The following awards to medical officers are announced for services rendered in connexion with military operations in East Africa:

C.M.G.

Temporary Lieut.-Colonel Hugh Basil Greaves Newham, R.A.M.C.

Major (acting Lieut.-Colonel) Richard Edmond Humfrey, R.A.M.C.

C.I.E.

Lieut.-Colonel (temporary Colonel) William Wellesley Clemesha, I.M.S.

O.B.E.

Temporary Majors: Robert Semple, R.A.M.C.; Robert Standish White, R.A.M.C., attached Northern Rhodesia Medical Corps.

Captains: Charles Percivale Bligh Wall, S.A.M.C.; Isidore Jack Block, S.A.M.C.; George McGregor Millar, I.M.S.

Temporary Captains: Arthur George Eldred, Special List, Nyasaland Medical Service; Charles Reginald Howard, R.A.M.C.; Quintus Madge, R.A.M.C.; Legh Richmond Herbert P. Marshall, R.A.M.C.; Samuel Mason, S.A.M.C., attached 2/1st Battalion, King's African Rifles.

M.B.E.

Temporary Lieutenant Arthur William Joblins Pomeroy, West African Frontier Force, attached Medical Services, East Africa.

To be Brevet Majors.

Captains (acting Lieut.-Colonels) J. D. Kidd, M.C., R.A.M.C., J. A. Manifold, D.S.O., R.A.M.C.

Captain E. A. Sutton, M.C., R.A.M.C.

Military Cross.

Captain Atholl Robertson, R.A.M.C.

The Meritorious Service Medal has been awarded to ten warrant and non-commissioned officers and privates of the R.A.M.C.

ORDER OF THE BRITISH EMPIRE.

The *London Gazette* of February 18th announces the following appointments to the Order of the British Empire for valuable services rendered in or in connexion with military hospitals, war hospitals, auxiliary and civil hospitals, command depôts, convalescent camps, or other duties of a similar nature in the United Kingdom in connexion with the army during the war.

C.B.E. (Civil Division).

Reginald Alcock, M.B., F.R.C.S.; Alexander Richard Anderson, F.R.C.S.; Herbert George Frankling, M.R.C.S.; William Henry Clayton Greene, M.B., F.R.C.S.; Robert George Hogarth, F.R.C.S.; Russell John Howard, M.S., F.R.C.S.; William James Howarth, M.D., D.P.H.; Professor Bennett May, M.B., F.R.C.S.; William Cuthbert Morton, M.D.; Frank Nicholson, M.D.; Alfred James Rice-Oxley, J.P., M.D., M.R.C.P.; Thomas Young Simpson, M.D., M.S., F.R.C.S.

O.B.E. (Civil Division).

Robert Young Aitken, M.D., F.R.C.S.; George Edward Genge-Andrews, M.B., B.S.; George James Mouncey Atkinson, M.R.C.S.; Isaac Banks, M.D.; Richard Henry Barter, M.B., B.Ch.; William Charles Bentall, F.R.C.S.; Edward Joseph Blackett, M.R.C.S.; Joseph Blomfield, M.D.; Frederick Lenox Harman Brown, M.B., C.M.; Lieut.-Colonel William Hotson Cadge, I.M.S.; John Cashin, F.R.C.S.I.; James John Day, M.R.C.S., D.P.H., John Elliott, M.D., F.R.C.P.; Henry Brown Elton, M.B., B.C.; David Ewart, M.D., Ch.B., F.R.C.S.; Francis Harold Fairweather, M.D., M.S.; Henry Dawson Farnell, J.P., F.R.C.S.; Edmund Towers Fison, M.D., D.P.H., F.R.C.S.; James Finlayson Fleming, M.B., Ch.B.; Joseph Vincent Fox, M.B., C.M.; John Dudgeon Giles, M.D.; Herbert James Godwin, M.B., F.R.C.S.; James Edward Gordon, M.R.C.S.; Bernard James Guillemard, M.D.; John Atkinson Harrison, M.B., C.M.; Joshua Harold Harvey, M.R.C.S.; Edward Drummond Hay Hawke, M.R.C.S.; Alfred William Hunton, M.R.C.S.; Miss Mary Ethel Jeremy, M.B., B.Ch.; John Rushworth Keele, M.R.C.S.; Charles Gilbert Burrington Kempe, M.D., B.S.; Martin Aston Key, M.B., B.Ch.; Miss Mary Forbes Liston, M.B., Ch.B.; Cecil John Read MacFadden, M.D., C.M.; John Macintosh, M.D.; Arthur Martin Mitchell, M.D., B.C., D.P.H.; Herbert Charles Orrin, F.R.C.S.; Reginald Christopher Peacocke, M.D.; George Henry Percival, M.B.; Charles James Pinching, M.R.C.S.; Arthur Young Pringle, M.R.C.S.; Frank Radcliffe, M.B., Ch.B.; Bernard Rice, M.D.; Kenneth Rogers, M.D.; Miss Winifred Margaret Ross, M.B., Ch.B.; Steward Henry Rouquette, M.B., B.Ch., F.R.C.S.; Lewis Erle Shore, M.D., B.Ch.; Edward Walpole Simmons, M.D.; Charles Dudley Somers, M.B.; Miss Florence Ada Stoney, M.D., B.S.; John William Taylor, M.D., Ch.B.; Berthold Bezly Thorne Thorne, M.D., B.S.; John William Thomson Walker, M.B., C.M., F.R.C.S.; Arthur Douglas Webster, V.D., M.D., D.Sc., F.R.C.P.; Cyril George Russ Wood, F.R.C.S.; Robert Alfred Worthington, M.B., B.C., F.R.C.S.

England and Wales.

THE EAST MIDLANDS UNIVERSITY.

AN article by Professor Frank Granger in the issue of *Nature* for February 13th shows that the movement in favour of creating a university for the East Midlands, with its seat at University College, Nottingham, has made considerable progress. The decision to apply for a charter was reached at a meeting presided over by the Duke of Portland (president of University College, Nottingham) and attended by representatives of the counties of Derby, Leicester, Lincoln, Northampton, Nottingham, and Rutland. The meeting affirmed the need for a university providing university and advanced technical education, and promoting scientific research in the East Midland area, and began the formation of a committee to take the necessary steps. At present University College, Nottingham, and the Midland Agricultural College are the only institutions within the area which, in a systematic manner, provide instruction and pursue research of the highest standard; but there are in existence, or immediately contemplated, a considerable number of institutions providing instruction of a special character, which will become parts of the new university, ranging through various degrees of affiliation to the position of schools in the university. Schools of engineering, lace, and hosiery will, it is expected, take their respective places on a footing like that of the existing Agricultural College, and plans for the establishment of colleges of pure science and arts are being developed. The proposed university would be of a federal character as the various schools rise towards and obtain recognition. Nottingham, as has been said, is to be the centre, and it is pointed out that Derby and Leicester are within half an hour by rail, while the remoter centres of population, such as Lincoln and Northampton, are within easy reach of one at least of the cities already mentioned.

CONTROL OF TUBERCULOSIS IN WALES.

The Welsh Outlook has published a supplement on the campaign against tuberculosis carried out by the King Edward VII Welsh National Memorial Association. It was founded in 1910 with a gift of £125,000 from one family. It commenced the actual work of treating patients in July, 1912, and now has contracts with all the Insurance Committees in Wales and Monmouthshire for the treatment of insured persons suffering from tuberculosis, in return for the sum of 9d. a head per insured person out of the sanatorium benefit fund of each committee. The cost of maintenance in respect of the institutions and of administration is met out of the income derived from the invested funds of the association, the contributions from Insurance Committees, and Treasury grants in respect of income from sums invested and of interest on capital invested. The deficiency is allocated among the county and county borough councils in Wales and Monmouthshire and the Treasury, the association having undertaken, in return for the moiety from the local authorities named, to extend treatment to non-insured persons. The association is managed by a council of 80 members, of whom 32 are appointed by county councils and county borough councils, and 21 by the Insurance Committees.

Before the establishment of the association there existed the West Wales Sanatorium and the open-air home for children, erected and maintained by Miss A. M. Davies of Treborth, Bangor. Both these institutions have been presented to the association, and the accommodation at the former has been increased from twenty-three beds to eighty-two, while at the latter the accommodation has been exactly doubled. The Pontywal estate in Breconshire was purchased by the association, and a sanatorium providing 304 beds, believed to be the largest in the United Kingdom, has been built. Sir D. S. Davies some years ago presented an estate at Llangwyfan, in the Vale of Clwyd; here the North Wales Sanatorium, with 184 beds, has been erected, and the donor has built on the estate a block for the treatment of persons suffering from surgical tuberculosis. Altogether the association owns 381 hospital beds, and has arranged with various authorities for 318 more.

In a short article on treatment in sanatoriums, Dr. H. E. Watson, medical superintendent of the North Wales Sanatorium, writes:

> The most complete scheme of graduated exercises is that laid down by Dr. Marcus Paterson, the late medical director of the association, and now practised in the sanatoria of the association. As a result patients are restored to working capacity more quickly than formerly, and on leaving the sanatorium are, in the majority of cases, fit at once to re-enter the ranks of the wage earner, and with a better prospect of remaining well. The success of the sanatorium depends largely on the degree of supervision exercised over the whole lives of the patients, and on the degree of co-operation which can be induced on the part of the patient. One point which should be emphasized is that the success of the sanatorium is further dependent on the early recognition of the disease, and where this is delayed a successful issue to treatment becomes more remote and unlikely.

In a note on the factors in a successful fight against tuberculosis, Sir William Osler lays down the following conditions:

> The essential factors in the fight are (*a*) the improvement in the social and hygienic surroundings—better homes, better habits, more fresh air, more food, shorter hours, less beer; (*b*) the most watchful care about the beginnings of ill health, particularly in children, who should be systematically inspected, etc.; (*c*) early diagnosis, for which purpose the tuberculosis dispensary is all-important, and as a centre for the examination of contacts, and for the education of the public; (*d*) sanatoriums in which early cases may be cured or the disease arrested, and all educated; (*e*) the extension of the home treatment under the supervision of the tuberculosis officer; (*f*) hospitals for advanced cases, and the most rigid supervision of all *open cases* in their homes; (*g*) a larger staff of specially trained nurses for dispensary, home, and sanatorium work; and, lastly, a central institute which will (1) house the general staff; (2) organize the work to the smallest details; (3) be in sympathetic touch with every tuberculosis officer and nurse; and (4) conduct actively researches into the pathology and treatment of the disease.

Scotland.

THE NEONATAL MORTALITY RATE IN EDINBURGH.

THE *Scotsman* newspaper included recently in its weekly report on the health of the city of Edinburgh a few lines on the neonatal death-rate for the month of January. It will be remembered that Dr. J. W. Ballantyne, in an address given at the annual meeting of the National League for Health, Maternity, and Child Welfare in London last July, made a strong appeal for the separate and prominent publication of the neonatal mortality rate in all large towns and districts of the country (BRITISH MEDICAL JOURNAL, July 13th, 1918, p. 32). He gave reasons for regarding the neonatal rate (that is, the number of deaths in the first month of life per 1,000 live births) as the most sensitive index of the general welfare or ill health of the community; for this and other reasons he urged that this mortality rate should be picked out for separate publication and placed alongside of the general birth-rate, the general death-rate, and the infantile death-rate, so that the public might know how matters stood in this important section of vital statistics. The large national annual statistical reports give this rate along with those of various other months and years in life, but these reports do not always reach the general public.

The Edinburgh report for January, after referring to the prevalence of the zymotic diseases, to the general and infantile mortality rates, and to the birth rate, adds: "During the month of January 30 deaths occurred in the case of infants under the age of one month, being equal to an annual neonatal mortality rate of 67.4 per 1,000 births. For the corresponding month of last year the rate was 37.2 per 1,000 births." Probably temporary or local causes account for the great increase which this rate shows over that of the corresponding month in last year—the prevalence of influenza, perhaps—but the striking fact remains that there are periods when in these first four weeks of life 67 out of every 1,000 babies born alive may perish. Obviously efforts must be made to lessen this great mortality if child welfare work is not to be loaded with a dead weight of disaster that must go far to take all the hopefulness out of its propaganda. For this reason the new departure made by the Edinburgh health authorities in supplying the newspapers with the neonatal mortality rate (a practice which we understand is to be continued monthly) may be timeous and helpful, although

it must be confessed that this first announcement is depressing. It would be well if other large centres of population were to be afforded the opportunity of clearly recognizing the incidence of disease and death in these early and most deadly weeks.

Correspondence.

THE TEACHING OF OBSTETRICS AND GYNAECOLOGY.

SIR,—In your leading article in the BRITISH MEDICAL JOURNAL of February 15th on the teaching of obstetrics and gynaecology there is a paragraph beginning, "We are not prepared to follow Dr. Fairbairn in his suggestion that the care of the infant up to nine months or a year might advantageously be the province of the obstetrician." I made no such suggestion, and rather argued for the reverse of this, but apparently my open mind as to where the dividing line between obstetrics and pediatrics should be drawn left room for ambiguity, as some of the speakers at the meeting obtained a similar impression to that conveyed by your leading article. As time did not allow of my clearing the matter up at the meeting I beg your indulgence to do so now.

I took it for granted that the baby for the first few weeks must be in charge of the obstetrician, as he teaches by example as well as precept. Throughout pregnancy and labour his teaching has been directed towards the prospect of two patients, and to one thoroughly imbued with this idea the handing over the charge of one patient the moment that prospect has been realized seems almost impossible. Your leading article speaks of birth as the logical point to draw the dividing line, but there is no logic in treating mother and child separately from birth; there is the all-important question of breast-feeding, for instance, to which consideration has been given throughout pregnancy and which is not established till some days after birth. From the standpoint of preventive medicine, the head of the clinic must be responsible for seeing that his students pay full attention to both patients, and cannot delegate his responsibility in regard to one of them to a colleague without detriment to his influence and his teaching. The example of his interest and thought for the baby patient is a most potent factor in creating that preventive atmosphere about the training of his students which it was the object of my paper to urge.

I think the misapprehension as to my view arose through my describing the baby clinics at St. Thomas's as having "evolved" from the obstetric department and being in its charge. But it was clearly described as a stage in evolution and not as a fully developed scheme, which I suggested would be "the appointment of a special officer for the child welfare clinics, who would begin by taking part in the teaching on the infant in the maternity ward, where he will become known to the mothers and learn to know them, and thus preserve continuity from the maternity clinics to the baby clinics." This "liaison" officer, as I termed him, was meant to be a pediatrician, but perhaps I ought so to have labelled him, though his office ought to have been understood, as immediately afterwards the impossibility of the obstetric officers undertaking the infant clinics is stated. My argument was that so close a co-ordination is required between obstetrics and pediatrics—both for success in working the centre and for the training of students—that the pediatric officer, as one of the team, must know from the start what is being done for mother and infant, and should be responsible for continuity of policy from maternity ward to infant clinic. I felt it impossible to draw any hard and fast dividing line between obstetrics and pediatrics, and left it open because there must be an intermediate stage of co-dominion, of handing over and taking over, during which the obstetric chief is responsible for mother and infant, and insists on his students following his lead; but, at the same time, he seeks the advice of, consultation with, and the aid in teaching of his pediatric colleague. Till mother and child are discharged from hospital to clinic their supervision is not taken over by the pediatric side of the team.—I am, etc.,

London, W., Feb. 18th. JOHN S. FAIRBAIRN.

THE PRESENCE OF A FILTER-PASSING VIRUS IN CERTAIN DISEASES.

SIR,—In the BRITISH MEDICAL JOURNAL of February 1st, 1919, a preliminary paper by Bradford, Bashford, and Wilson briefly refers to a group of filter-passing organisms in typhus and in other diseases which appears to be identical with a group of filter-passing organisms which were first described by Hort and Ingram in May, 1914, in connexion with typhus fever. Between that date and the present day numerous publications have appeared under my name in which I have referred to the presence of similar filter-passing organisms, not only in typhus fever, but also in scarlet fever, measles, German measles, mumps, epidemic pneumonic affections, and cerebro-spinal meningitis.

In each case except the last the organisms in question were found in Chamberland F filtrates, the use of Berkefeld filters of all meshes being discarded by me as not affording satisfactory evidence of genuine filterability in the usual bacteriological sense. In each case the filtrates proved, when inoculated in the fresh, or nearly fresh, condition, to be highly pathogenic to monkeys, and often to guinea-pigs and rabbits. These inoculation experiments were in all cases elaborately controlled. In many cases, especially in typhus fever, the organisms could be cultivated for a short time in filtered citrated human blood, and on slices of sterile rabbit kidney. The organisms frequently occurred as minute coccoids, varying from about 0.2 μ, or less, to about 0.5 μ, being seen singly, in pairs, or in short chains. They prefer aërobic to anaërobic conditions, and were demonstrated in filtered blood, cerebro-spinal fluid and urine in all the acute typhus cases examined, as well as in unfiltered blood, cerebro-spinal fluid and urine. They were also demonstrated in filtered throat washings, and in unfiltered throat washings, in the early stages of scarlet fever, as well as in the blood and urine. In measles, German measles, and mumps, they were invariably to be found in fresh urine during the early stages of the disease, each disease presenting its own morphological variations, though these are slight, in stained and unstained films. Control observations of normal urines, of normal bloods, and of normal specimens of cerebro-spinal fluid, in the case of typhus fever observations, invariably gave negative results.

Speaking from memory, on duty in France, the number of cases examined was roughly as follows in the five years in which I have been almost continuously engaged in the study of this remarkable group of organisms: Typhus fever 40 cases, scarlet fever 20 cases, measles 12 cases, German measles 8 cases, mumps 12 cases, epidemic bronchopneumonic and pneumonic affections 7 cases, epidemic cerebro-spinal fever 30 cases.

In addition to numerous references in the medical press, I have given several demonstrations, both in public and in private, of the morphology of various members of this group of organisms as exhibited by film preparations, and by photographs by F. M. Duncan of filtrates showing their presence. The chief of these demonstrations was in a private meeting in 1915 at which Sir Alfred Keogh, D.G. A.M.S., Professor Adami, Surgeon Captain Bassett-Smith, Professor Farmer, Sir Humphry Rolleston, and others were present, and at meetings of the Royal Microscopical Society in Hanover Square. These demonstrations were accompanied by exhibitions of a long series of temperature charts, illustrating on the one hand the high degree of pathogenicity of these organisms in filtrates, and on the other the complete absence of fever in uninoculated selected animals. As a result of the meeting in 1915, I was officially instructed by the D.G. A.M.S. to pursue the study of this group of organisms on a much more extensive scale than had up to that date been possible. For eighteen months, therefore, after that date, an exhaustive study—bacteriological and experimental—of this group of organisms was made by me in typhus fever, and independently by Captain A. H. Caulfeild in the Addington Park laboratory, and in cerebro-spinal fever by Captain Caulfeild and myself in conjunction. Some of the work in cerebro-spinal fever has already been published, the very considerable mass of fresh data with regard to typhus now awaiting publication and the advent of less laborious days to arrange these data. Here I must be content with saying that in typhus fever the presence of the same group of organisms has been repeatedly established by me by passage through a long series of human cases, monkeys,

and guinea-pigs; the infectivity of the filtrates of the blood and cerebro-spinal fluid, Chamberland F filters being again exclusively employed, from the human cases and from the animal carriers being established beyond any possibility of doubt. Much work, however, still remains to be done in typhus and in all the other diseases mentioned in order absolutely to establish full etiological relationships.

This is one of the reasons I have hitherto been content with fragmentary preliminary accounts of my work on these filter-passing organisms, in the hope that meanwhile the original observations of Hort and Ingram in 1914 in typhus fever would be confirmed by other workers. This hope appears now to have been fulfilled by independent workers, clearly unaware of my earlier publications, and I sincerely trust that their interesting and valuable paper will stimulate further efforts in a most difficult field of study. Not the least of the difficulties to be encountered is the fact, as Captain Bashford and Captain Wilson will soon discover, that the appearance of the particulate organisms demonstrable in the blood and cerebro-spinal filtrates is preceded by the appearance of an organic virus the intimate structure of which is more difficult optically to determine, and which is at the same time more highly infective, than is the case when development has proceeded to the point at which definitely visible organisms appear. The significance of this observation in all filtration experiments, provided that good filters are employed, will not escape notice.—I am, etc.,

EDWARD C. HORT,
Hon. Lieut.-Colonel R.A.M.C. (temporary).

France, Feb. 6th.

REFERENCES.

BRITISH MEDICAL JOURNAL, July 4th, 1914, p. 15. Proceedings, British Medical Association Meeting, Aberdeen, July, 1914, BRITISH MEDICAL JOURNAL, April 17th, 1915, p. 673. *Journ. Roy. Army Med. Corps*, February, 1916. Ibid., September, 1916. *Journ. Roy. Micros. Soc.*, December, 1916. *Proc. Roy. Soc.*, vol. 89, 1917, etc. The article in the BRITISH MEDICAL JOURNAL of April 17th, 1915, containing references to the filter-passing organisms found in typhus fever, was translated into French, Russian, and Serbian, and was circulated in Serbia during the summer of 1915 by the British Red Cross Society.

DIFFUSE EMPHYSEMA OF THE WALL OF THE SMALL INTESTINE.

SIR,—Under the above heading Mr. C. A. R. Nitch and Professor S. G. Shattock, F.R.S., reported a case before the Pathological Section of the Royal Society of Medicine recorded in your issue of February 15th. From the description the case was evidently an example of the disease usually designated "Gas Cysts of the Intestine," a case of which was investigated and described by Professor T. Shennan and myself in 1909 (*Journal of Pathology and Bacteriology*, vol. xiv, p. 259). In this case, as in at least ten of the twenty previously recorded, there was a stenosis from ulceration in the pyloric region, the patient dying from haemorrhage from the ulcer.

The cysts in our case, as in the majority of others recorded, were situated in the last two feet of ileum, the jejunum being entirely unaffected. Some cysts were situated on the peritoneal surface of the intestine and were pedunculated, others were found in the submucosa. Microscopic examination of the smaller cysts showed them to contain and to be partly lined by giant-cells, some of which were vacuolated and appeared to be secreting the gas. Cultures taken from the cysts both during life and after death gave a growth of *B. coli communis*. Whilst placing little reliance on the evidence of *post-mortem* culture, the leucocytic infiltration round most of the cysts made us conclude that the primary factor in their origin was probably bacterial.

Whether the condition is the result of organismal infection or is a form of new growth is as yet undecided. I think, however, we may definitely exclude the theory advanced by Mr. Nitch and Professor Shatteck that it is an emphysema the result of gas being driven into the wall of the gut by way of the edge of an ulcer in the duodenum, as in all recorded cases the duodenum itself has been free of the cysts which have been most numerous in the lower ileum.

It is of interest to know that John Hunter described a similar condition in pigs, and an investigation of this condition by the Department of Agriculture in Washington revealed the presence, in the cysts, of an organism of the colon group in every case examined.—I am, etc.,

Edinburgh, Feb. 15th. D. P. D. WILKIE, F.R.C.S.

METHODS OF INFANT FEEDING.

SIR,—As an infant welfare doctor, I cannot let Dr. Laing's criticism of some modern methods of infant feeding (BRITISH MEDICAL JOURNAL, February 8th, p. 150) pass unchallenged. I agree with him that a hard-and-fast rule for infant feeding will lead to many disasters. Every infant is a law unto itself; not only have *age* and *body weight* to be taken into consideration in determining the dietary, but a third factor more important than either of the others—the *individuality* of the child. Thus the thin, active, muscular type of baby usually needs a bigger feed than a quiet placid infant of the same age and of perhaps even heavier weight. Or a baby who has lost weight through illness requires, once convalescence is established, an apparently excessive diet. The *atrophic* babies, again—that difficult class of infants who from birth, or more frequently from the time the breast milk ceases, fail to thrive satisfactorily—once their metabolism (as a result of treatment) becomes normal, require feeds of caloric value out of all proportion to their body-weight.

As a general rule the baby at the breast knows when it has had enough, and provided it be not allowed merely to use the nipple as a dummy to go to sleep with, I consider, with Dr. Laing, that it should be allowed to suck as long as it likes, and not for any stated number of minutes; for a vigorous infant will obtain in ten minutes what a more weakly one will spend half an hour in acquiring.

When we come to deal with the bottle-fed baby, however, I do not agree that the infant's inclination can be entirely followed. Dr. Laing says it is difficult to overfeed such a baby, "if the mixture be of suitable strength, the teat not too large, and the baby *not allowed to suck too long*" (the italics are mine). That is just the point: with the bottle-fed baby we have to some extent to regulate the feeds. The ideal teat has still to be invented. Teat bores should be graded so that a hole of any required size could be obtained. In practice it is difficult to secure a teat with a suitable bore; should one succeed, a very few days' use enlarges the hole so that it becomes too big, and in consequence the bottle is gulped down so rapidly that no feeling of satisfaction results. Less frequently the bore is too fine, and the infant becomes tired with sucking—satisfied in a sense for the moment—before the full ration is taken, whereupon the anxious mother, seeking the aid of a red-hot needle, enlarges the hole and usually oversteps the mark.

Turning now to the *interval between feeds*. When first qualified I advised as I had been taught, and advocated two or two and a half hourly feeds for very young babies, with four-hourly feeds at night. I have long since given this up and have become a firm convert to the "three-hourly, no night feeding" school. In the course of some nine years' experience at schools for mothers and infant consultations the conviction has become deeply rooted that for the great majority of babies this method gives the best results. Unlike Dr. Laing I find flatulence is usually attributable to too frequent or irregular feeding and once the infant has adopted the three-hourly routine the trouble tends to disappear, provided of course the bowels be kept regular. In this part of the country at any rate the untaught mother feeds her infant not at any set time, but simply whenever it cries. If subsequently it sleeps for several hours on end she is thankful for the respite to attend to her over-numerous other duties. The process of feeding a baby, including the necessary "toilet" and the procedure known as "getting the wind up" occupies not far short of an hour. The infant is then (theoretically at any rate) laid in its cot or pram to sleep, but some time probably elapses before it finally settles off, so that the next *two*-hourly feed becomes due just as it is in a deep restful sleep. To awaken it at this juncture seems to me absolutely wrong; both mother and child would suffer.

The *three-hourly* method on the other hand allows time for a good sleep between feeds, and if there is a little waking interval before the next meal time arrives, a suitable opportunity is afforded for exercise and for fondling and nursing.

The "pitiful cries" of the babies to which Dr. Laing refers may be due to many causes other than hunger—cold feet, thirst, lack of sleep, constipation, to mention only a few. Labour saving is the cry of the moment: we want to simplify life. The task of bringing up a family is difficult enough even amongst the affluent. Amongst mothers

of the infant welfare class the strain involved is enormous; a baby is often said to be one person's work, but here, in addition to baby tending, one pair of hands has to wash and cook and mend and clean. In these cases is two-hourly feeding practicable? I say not. Such advice leads merely to irregular feeding. No working-class mother could keep up with it—hence she feeds the baby when awake whenever it cries, and for the rest thankfully lets it sleep as long as it will!

The three-hourly plan she can attempt to follow. Hence by advocating it from the beginning we may lighten her burden. The habit of sleeping all night without a feed is readily acquired if insisted on from the first, and the long rest benefits mother and child alike.

The great majority of nurses of my acquaintance favour the three-hourly plan, not from any lazy motive, but because they are convinced of its superiority to the older two-hourly plan. Premature and weakly infants may need more frequent feeds, lest the total day's intake of food be insufficient to promote growth. A steady gain in weight is the safest criterion of progress, and this can in the vast majority of cases with which we have to deal be obtained with the three-hourly method, provided the food be adapted, qualitatively and quantitatively, to the individual in question.—I am, etc.,

G. H. HICKLING, M.D., D.P.H., B.Sc.

Dalgarth, Romiley, Feb. 7th.

THE UNITY OF THE PROFESSION.

SIR,—We are on the edge of a great abyss, we are on the verge of disaster, we are on the verge of losing our freedom and becoming paid servants, and one of our profession is directing us thereto. Before it is too late, let us examine our strength of resistance, and, for the sake of the professional freedom of ourselves and those who are to follow us, let us organize under a strong leadership and fight to the bitter end.

The work of general practice is not work that can be satisfactorily carried out by salaried men or on contract terms. The treatment of cases, as we are so excellently taught in the wards of our hospitals, cannot be successfully pursued in general practice. Any general practitioner who attempts to treat cases in private as he did when he was house-surgeon or house-physician very soon finds that he has got to alter his ways or look out for something else to do.

If this so-called State medical service is going to be introduced, in a very short time we shall have a large gang of medical men whose one object will be to get their day's work finished as speedily as possible and do as little as they can for the salary offered: that is the natural trend of paid servants.

At the present moment the Government is master of us and, mark my words, is in full knowledge of the fact. Our only Association, the British Medical, excellent as it is in many ways, is being fooled; occasionally a little sop is given to it, but the fact remains that when it comes to bargaining the Association is helpless and the Government will see to it that it remains so if it can possibly manage it.

The sooner the profession realizes that Dr. Addison is not working for it, and cares nothing for it, the better; we are gradually being forced to fight, and unless we can quickly organize our forces and arm them the result is a foregone conclusion.

I am one of those who think there is plenty of room for amicable work between the British Medical Association and the Medico-Panel Union. The British Medical Association is the pioneer, and must uphold the rights of the majority. This it cannot do at the present time because it has no power of punishing any refractory member except by expelling him and thus still further weakening our forces. What is required is that the British Medical Association should have power to say to the Government, "Hands off!" and mean it. If all the members of the British Medical Association would also join the Medico-Panel Union that power is at once in their hands, and I do not think it would have to be used. It would very speedily be seen that instead of being told what we are to do we should be politely consulted on bended knee. At the present time I am a member of neither society, but loyal in every respect to the British Medical Association. I am perfectly prepared to join both if they will work together for our interests.—I am, etc.,

WILLIAM ESCOMBE, M.R.C.S., L.R.C.P.

Grimsby, Feb. 9th.

THE FUTURE OF THE MEDICAL PROFESSION.

SIR,—In view of coming developments in the way of a State medical service, various committees have been formed for the purpose of watching over and guarding the interests of the medical profession. The necessity of rendering these committees as representative of the profession as possible has been repeatedly emphasized, and they have been made to include on their strength consultants, general practitioners, panel doctors, public health and Poor Law officials. Yet in spite of the anxiety shown to guard the interests of all these branches of the profession, there is one great body of medical men that is apparently unrepresented. Nevertheless, it is to this unrepresented group that the coming of any form of State medical service is a matter of such vital importance. I refer to the medical men who have served overseas during the present war, and, having lost their pre-war practices, are now faced with the necessity of starting their professional life over again. Surely those who have staked so much already, and are looking forward to the possibility of State employment as a means of obtaining a decent livelihood, are worthy of direct representation on some of these so-called representative committees.

It may be offered as an explanation of this omission that the very fact that these men were serving abroad at the time of forming the committees made it impossible to find suitable representation. But at the present moment, when many of these medical officers have returned from overseas, this excuse is no longer valid. Suitable representatives can now be selected. Nor can the protestations of those of the profession who have remained at home during the war to the effect that they are fully conscious of their obligations to guard the interests of their absent colleagues be considered sufficient. Wrongly or rightly, the men who have lost their practices through absence are not entirely comfortable about leaving their future in the hands of others. Of the good intentions of many of their home colleagues they are fully conscious, but good intentions are but good intentions, and a future that rests on such a foundation is none too satisfactory.

At the end of the South African campaign an association was formed of medical men who had served abroad during the war. The formation of such a society after the present war would, of course, be a very much bigger undertaking. But is such an idea altogether unfeasible? The bond that links together medical men who have served abroad during the present war is a very real one—a bond that is as great, if not greater, than that which unites those who have been educated at the same school, or university, or hospital. Has this idea, that has doubtless arisen in the minds of many of us, begun to materialize, or is it merely an idea that will never take outward form? The difficulties of realizing such a project may be great, but if thereby something of the comradeship we have known abroad can be preserved at home, surely those difficulties are worth tackling.

Can any one tell me if any steps have been taken in this matter, or if, indeed, such are even contemplated?—I am, etc.,

KENNETH M. WALKER,
Captain R.A.M.C.(T.C.)

London, Feb. 4th.

MEDICAL RESETTLEMENT.

SIR,—I have followed with interest the correspondence in the JOURNAL on the questions of demobilization and the subsequent future of junior R.A.M.C. officers. It appears to me that there is a class whose claims have not yet been put forward. This is composed of men who have held hospital appointments before the war, and who then intended to start practice, or to specialize. Many of the latter now cannot do so owing to the lapse of time—four years or more—the lack of opportunity and experience in their special subject in the R.A.M.C., and the necessity, perhaps from family and financial reasons, of now "settling down." The date of their demobilization is still uncertain, and, even when they are free, they have nothing definite

to which to return. Many owing to ill health shrink from the struggle of commencing general practice.

Within the last few months I have met many officers in these circumstances, and some definite information on the following points would be very welcome, as it would make future prospects less uncertain:

1. Will there be many whole-time appointments vacant under the Ministry of Pensions? It is presumed there may be, as rumour has it that the Ministry will at some future date take over several institutions now under military control; and there may be other appointments, not institutional.

2. Will such appointments be made widely known, by advertisement or other means, so that all such officers may have the opportunity to apply?

3. Will such officers, if appointed under the Ministry of Pensions before their demobilization, be allowed to demobilize or transfer from the R.A.M.C.?—I am, etc.,

February 3rd. "HOPEFUL."

SIR,—With reference to the demobilization of medical officers, it would appear that, in addition to those who left practices or teaching posts to join up at the beginning of the war, there are others—the then more recently qualified—who were pursuing studies for further or higher professional qualifications. In exceptional cases some by taking up specialist work may have been able to accumulate wholly or partially the material for the examination or thesis they had in view. Others, and this more especially applies to those who have devoted their attention to field ambulance and regimental work, have perforce been prevented from recontinuing their studies.

I should like to endorse all that Major Gibbons says in the letter published in your issue of January 25th. It would seem to be only fair that those whose studies were interrupted should be given consideration in the order of demobilization, this applying specially to those who joined up early in the war.—I am, etc.,

B.E.F., Feb. 1st. REGIMENTAL M.O. (S.R.).

The Services.

INDIAN MEDICAL SERVICE.

THE INCREASE IN GRADE PAY.

THE Secretary of State informed the deputation from the British Medical Association on February 10th that improvements had been sanctioned in the rates of pay for permanent officers of the Indian Medical Service on both the military and civil sides approximating in the aggregate to an increase of 33⅓ per cent. on the present rates of military grade pay. He stated that the detailed rates of pay to give effect to the decision are being worked out in India, and will be announced as soon as possible. Meanwhile, taking the old rates of grade pay and adding 33⅓ per cent., we find the following:

Grade Pay: Rupees a Month.

	Old.	New (estimated).
Lieutenant	350	467
Captain	400	533
,, after 5 years' service	450	600
,, ,, 7 ,, ,, ...	500	667
,, ,, 10 ,, ,, ...	550	733
Major	650	867
,, after 3 years as major	750	1000
Lieut.-Colonel	900	1200
,, ,, specially selected ...	1000	1333

The sterling value of the pay in rupees, which is, of course, of importance to a European who has to remit money to London, depends on the rate of exchange. By an Act of 1899 the value of the rupee cannot fall below 1s. 4d. It has appreciated during the last few years and is at present (February 20th) 1s. 6d. It is not thought probable that it will go back to 1s. 4d. We have, however, calculated the sterling equivalent of the new grade pay at both 1s. 4d. and 1s. 6d.

Grade Pay: New Scale: Sterling Equivalents (approximate).

	Sterling Yearly.	
	At 1s. 4d.	At 1s. 6d.
Lieutenant	374	421
Captain	427	481
,, after 5 years	480	541
,, ,, 7 ,, ...	534	602
,, ,, 10 ,, ...	586	661
Major	693	782
,, after 3 years	800	902
Lieut.-Colonel	960	1083
,, ,, specially selected ...	1066	1203

The new grade pay is to have retrospective effect from December 1st, 1918. The new rates for officers in military employment set out in Army Instruction (India) No. 1343 (published in the BRITISH MEDICAL JOURNAL on February 8th) came into force on the same day. To know what the exact effect of the increase of 33⅓ per cent. will prove to be in the case of officers in military employment we must wait for the promised announcement of the details now being worked out in India.

WAR GRATUITIES FOR OFFICERS.

THE Admiralty and the War Office have issued Orders with regard to the grant of special war gratuities to officers of the navy and army respectively.

Naval Service.

Separate scales are laid down (*a*) for permanent officers on the active lists of the Royal Navy and Royal Marines, and (*b*) for temporary officers R.N.R., R.N.V.R., retired, and emergency officers. For permanent officers on the active list a sum ranging from £15 in the case of a Paymaster Cadet, to £720 in the case of an Admiral of the Fleet, will be paid for the first year's service or part thereof. For each additional month after a year's service there will be an increment of £1. £2, or £3 according to rank, in the case of officers who have served at sea or overseas; or of 10s., £1, or £1 10s. in the case of officers who have not so served. Generally speaking, all naval service on full pay during the war will count towards the gratuity, but the maximum service is limited to five years, or to the statutory date for the termination of the war, whichever is reached first. The gratuity will be based on the relative rank (acting or confirmed) held on November 11th, 1918, but provision is made for subsequent advancement in rank. Retired officers or officers on the emergency list who are reinstated on the active list during the war will receive the gratuity under this Order instead of that laid down for officers on the retired lists.

Officers of the R.N.R. and R.N.V.R. receiving naval rates of pay will be granted a gratuity of 100 days' pay for the first year's service, or part of a year's service, and fifty days' pay for each subsequent year or part of a year's service. The cases of temporary medical officers are being dealt with separately, though it is not stated how. Further on the Admiralty Order lays down that gratuities will not be paid to, among others, officers serving under special contracts which provide for the issue of a gratuity. In such cases an officer may elect to take the gratuity under this Order instead, if more advantageous. Surgeon Sub-lieutenants R.N.V.R., who were allowed to resign to resume their medical studies are ineligible only when less than six months' service as an officer has been rendered. The gratuities will be issued on demobilization, and will be based on the full pay (exclusive of any allowances) of the acting or confirmed rank held at the date of demobilization, or if such is later than November 11th, 1918, on the latter date if more advantageous to the officer.

In the case of deceased officers the gratuity will be payable to the estate.

Military Service.

In the case of officers holding permanent commissions on the active list of the Regular Army the gratuities issuable in recognition of war services are set out in a schedule to a Royal Warrant, dated February 10th, 1919. War service is defined generally as commissioned service within periods beginning from August 4th, 1914, inclusive, and ending at the date of the termination of the war as statutorily defined, or August 3rd, 1919, whichever comes first. It includes any war service with the Egyptian Army, West African Volunteer Force, King's African Rifles, or in the Navy, Marines, or Air Force, which will qualify for a war gratuity under this Warrant had such service been in the Army. The minimum gratuity varies according to rank, thus: For a second lieutenant it is £35; for a lieutenant, £40; for a captain, £45; for a major, £60; for a lieut.-colonel, £75; for a colonel, £100; for a brigadier-general, £140; for a major-general, £200; and for a lieut.-general, £370. The definition of rank for

the purpose of the war gratuity is prescribed by the Army Council. Officers who have completed more than one year's commissioned war service will receive a further sum in respect of each additional month or portion of a month of commissioned war service, subject to a maximum of forty-eight such increments. If with service overseas this monthly increment will be £1 for officers of ranks or appointments carrying a minimum gratuity up to and including £75, £2 where the minimum gratuity is £100 or £140, and £3 for officers of higher rank. If with no service overseas the monthly increments will be reckoned at half the above rates.

The gratuity will in no case be issuable in addition to any gratuity under Article 497 of the Royal Pay Warrant; nor to an officer whose services are dispensed with, or who resigns his commission for misconduct or for other causes held by the Army Council to disqualify; nor to one who has relinquished his commission owing to ill health due to his own misconduct; nor to one who before November 11th, 1918, voluntarily resigned his commission after less than two years' service; nor to one who relinquished it on account of ill health not due to military service after less than six months' commissioned service. The gratuity will be credited to the estates of deceased officers direct from the War Office.

The British Medical Association is making inquiries as to the position of temporary surgeons R.N. and of Territorial, Special Reserve, and temporary officers of the R.A.M.C. in respect of war gratuities.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

The following medical degrees have been conferred:

M.B. and B.Ch.—F. Gray.
M.B.—H. W. Hales.

UNIVERSITY OF LONDON.

University College.

Mr. T. B. Johnston will begin on March 3rd, at University College, London, a course in anatomy for the Primary Fellowship Examination, specially suited for R.A.M.C. officers who are entering for the examination in May, 1919, under the special terms arranged by the Royal College of Surgeons. Particulars can be obtained from the Secretary of University College.

UNIVERSITY OF BRISTOL.

The following have been approved at the examinations indicated:

Final M.B., Ch.B.—*Part II* (completing examination): A. G. Bodman, Elizabeth Casson, Evelyn B. Salter, A. D. Symons, R. F. White. *Part I*: Sukhasagar Datta, T. H. A. Pinniger.
D.P.H.—J. W. Gilbert.

UNIVERSITY OF LEEDS.

Dr. J. B. Hellier has retired from the chair of obstetrics which he has held since 1908. He has been connected with the Leeds School of Medicine from his student days. He was appointed demonstrator in anatomy in 1881, became lecturer in materia medica and therapeutics in 1884, and was lecturer on diseases of women and children from 1889 to 1908, when he was appointed to the chair of obstetrics. He was Dean of the Faculty of Medicine in 1917-18. Dr. Hellier, who does not intend to retire from private practice, has been succeeded by Dr. E. O. Croft, who has been lecturer on gynaecology since 1908, and is a member of the staff of the Leeds Hospital for Women and Children and of the Maternity Hospital.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

At the monthly meeting of the Royal Faculty of Physicians and Surgeons of Glasgow, held on February 3rd, Major-General Sir William B. Leishman, K.C.M.G., C.B., F.R.S., was admitted an Honorary Fellow. At the same meeting the following were admitted as ordinary Fellows: Donald MacPhail, M.D., Coatbridge, and John Nairn Marshall, M.D., Rothesay.

M. M. Lafferre, the French Minister of Public Instruction, recently appointed a scientific commission to report on the faculties and laboratories in Alsace and Lorraine. It presented a scheme of reorganization of the University of Strasbourg. In accordance with a wish expressed by Alsatian students, the university was reopened on January 15th. Most of the professors of the Paris and provincial faculties, entrusted with the teaching till final arrangements can be made, were present at the ceremony. The immediate task of the new university is to afford Alsatian students the means of rapidly completing studies already begun or of commencing a first year curriculum drawn up in accordance with French methods.

Obituary.

E. O. PRICE, M.D.Edin., J.P.,

Bangor.

Dr. Emyr Owen Price, who died on February 7th, was born at Holywell, Flintshire, on July 19th, 1857. He was educated at St. Asaph Grammar School and the Edinburgh High School, and graduated M.B., C.M. in the University of Edinburgh, 1879, and M.D., 1891. He was one of the founders of the Students' Union at Edinburgh. In 1882 he took the practice of Dr. Ellis at Bangor, and had immediately to face a severe epidemic of enteric fever. He was appointed medical officer and public vaccinator of the Bangor District and Workhouse, and later to the University College of North Wales and to the Normal College, Bangor. After some years he was elected honorary medical officer to the Carnarvonshire and Anglesey Infirmary and later honorary surgeon to the same institution, a post which he held with increasing interest and efficiency until the end. He had been president of the North Wales Branch of the British Medical Association, and for years the annual representative of his Division to the Council of the Association. While the National Insurance Act was under consideration and negotiations were proceeding between the medical profession and the Government, he was elected by the British Medical Association on the Advisory Committee. In that capacity he had to sacrifice a great deal of his time and energy, his vists to London were frequent and his labours were strenuous and valuable. In recognition of such splendid services the medical men of North Wales presented him with a motor car. He became the first chairman of the Panel Committee of the county, and continued to retain that position until about a year ago, when he found it necessary to ask to be relieved of its duties. A few days before that date, and when his strong and clear mind was in full vigour and activity, the shadow of the dread angina pectoris fell upon his brave and noble spirit with all the superadded force of the knowledge that at about his own age then, his father had succumbed from the same cause. Nevertheless, he responded with admirable courage and success to the many extra calls of the war period upon his time and strength. He continued to attend the operating theatre of the Infirmary at any hour of the day and night. He became one of the medical officers to the Military Hospital at Bangor, took his share of the duties left to the remaining men by those local colleagues who had taken commissions in the R.A.M.C., was the chairman of the Local Medical War Committee, and worked hard to find fit and available men for the front; took a very active part in the establishment of the V.A.D. centre at Bangor, and took charge with keen interest of the maternity and child welfare clinic. Finally, he even had the alertness to seize with vigour an opportunity to think out and prepare a scheme for a public health laboratory for North Wales in connexion with the proposed new science department as a soldiers' memorial in the University College of North Wales. He visited the various county councils of North Wales to present this scheme, and with convincing eloquence succeeded in carrying the scheme through. He was a justice of the peace for the county of Carnarvon. It is feared that the strain during the severe epidemic in November taxed his strength too greatly. His condition since Christmas had caused anxiety, but no one was prepared for the end, which came on February 7th suddenly.

This were no place to refer at length to Dr. Price's many and various accomplishments. He was a richly gifted man, strong in character and intellect, widely read, endowed with sound common sense, and possessed an ever ready and witty speech. He will be greatly missed as adviser, friend, and counsellor, both locally and in the Representative Body. He is survived by his wife, three daughters, and one young son.

Dr. John Albert Manton, a well known Sheffield medical practitioner, died on February 4th from pneumonia following influenza. He was born at Wakefield in 1864, and studied medicine at St. Bartholomew's Hospital and at the medical schools of Leeds and the University of Durham, obtaining the M.R.C.S. and L.R.C.P. diplomas in 1886. Two years later he began practice in the Park

district of Sheffield. Among other early appointments, he was demonstrator of anatomy in the Sheffield School of Medicine. For many years Dr. Manton took a prominent part in municipal life as a member of the city council and a guardian. In addition to the work of a large private practice, he held the appointments of medical officer to the Sheffield Post Office and to the Education Department. He spent his holidays in travel, and made good use of his experiences, both on the platform and in various literary contributions. He visited Serbia in 1899, and wrote a series of sympathetic articles on life in the Balkans, in recognition of which he was appointed by King Alexander of Serbia a Chevalier of the Order of St. Sava. He was an enthusiastic cyclist, and was for many years president of the Sheffield Road Club, in this way adding year by year to his knowledge of local roads and of the antiquarian lore of the countryside. Dr. Manton leaves a widow, a son, and two daughters. He was for many years a member of the Sheffield Division of the British Medical Association.

THE death took place at Pretoria, on October 23rd, of Dr. DONAL M. BARRY, pathologist on the staff of the Pretoria Hospital. Dr. Barry was born in Ireland, and was educated at Clongowes Wood College and Queen's College, Cork, whence he graduated M.B., B.S., of the late Royal University of Ireland, in 1908. In his student days he was a well-known footballer. After a short period of practice in England, he was appointed house-surgeon to the Pretoria General Hospital. He returned home in 1914, and, after obtaining the D.P.H. diploma, was appointed pathologist to the Pretoria Hospital. The heavy strain of the recent influenza epidemic in South Africa overtaxed his health, and he fell a victim to influenzal pneumonia. Dr. Barry was a member of the Pretoria Branch of the British Medical Association. His untimely death is deplored by a wide circle of colleagues and friends.

IN the JOURNAL of February 8th there appeared a brief notice of the death of Dr. H. S. COGHILL, West African Medical Staff. The following further particulars are supplied by one who knew him intimately and had worked much with him: From 1909 to 1911 Dr. Coghill was demonstrator at the London School of Tropical Medicine. In 1913 he and Dr. H. M. Hanschell were sent by the Colonial Office to Sekondi, Gold Coast, to take part in the investigation of non-malarial fevers. Later Dr. Coghill left for the Northern Territories of the Gold Coast to investigate a reported outbreak of yellow fever. His careful work there brought to light facts proving that a disease clinically closely resembling yellow fever had been known among the natives for at least two generations. The disease—in recurring epidemics—had always come from the north in the Sudan. *Stegomyia calopus* was found right up to the Sudan frontier. The Hansa traders coming down to the coast from the Sudan and Northern Territories knew the disease. The importance of this—if it be yellow fever and not, say, "infective (spirochaetal) jaundice"—is that it explains the infection of the coast periodically with yellow fever, always a puzzle before, for no direct ship communication with known yellow fever centres existed. Coghill was generosity and honour personified; great patience and care marked his work. A large number of friends in West Africa must mourn his death, and the service itself has suffered a heavy loss.

Medical News.

DR. JOHN ADAMS, of Glasgow, happily recovered from a serious illness, was among those who attended the investiture on February 18th to receive the M.B.E.

A COURSE of lectures and demonstrations on surgical dyspepsia will be given at the London Hospital Medical College by Mr. A. J. Walton, assistant surgeon to the hospital, beginning on Monday next.

MAJOR-GENERAL WILLIAM C. GORGAS, formerly Surgeon-General of the United States Army, has been named a Commander, and Dr. Simon Flexner, director of laboratories of the Rockefeller Institute for Medical Research, an Officer of the French Legion of Honour.

THE murderous severity of influenza is illustrated by two recent reports. The one is that fully one-seventh of the population of Papetee, Tahiti, have died of influenza, the elder generation having been virtually wiped out. The other is the estimate that in Mexico the epidemic of influenza caused approximately 432,000 deaths.

Major-General Sir Robert Jones, C.B., F.R.C.S., Major R. C. Elmslie, F.R.C.S., and Major W. H. Trethowan, F.R.C.S., have been elected honorary surgeons to the Royal National Orthopaedic Hospital, London. Arrangements are being made for the establishment of a country branch for the hospital as well as for the enlargement of the present buildings.

THE Medical Research Committee has issued a report by Captains H. Marrian Perry and H. L. Tidy, R.A.M.C. (H.M. Stationery Office. Price 9d.) on an investigation of an epidemic caused by *Bacillus aertrycke*, a so-called "food poison infection," of which Drs. A. J. Jex-Blake and W. James Wilson gave an account in the BRITISH MEDICAL JOURNAL of September 21st, 1918, p. 310.

THE Section of Laryngology of the Royal Society of Medicine has arranged to hold a summer congress on Friday, May 2nd. Papers will be read in the morning; in the afternoon there will be demonstrations of cases, operations, specimens, and instruments, and it is proposed to arrange a pathological museum. The meetings of this section have been well attended during the war, among those present being many American and overseas laryngologists, and they are invited to take part in the summer congress.

PROFESSOR F. DE LAPERSONNE will begin a course of ten lectures on the surgery of the eye and orbit on March 11th. The course will be given at the Hôtel Dieu, Paris, and will include operative surgery. It is intended for doctors and students of allied and neutral countries. Professors Lapersonne and Terrien and Dr. Velter will begin on May 6th an advanced course on practical ophthalmology and laboratory work, open to French and foreign students. Further particulars can be obtained on application to Professor Lapersonne, at the Hôtel Dieu.

AT the meeting of the Executive Committee of the War Emergency Fund of the Royal Medical Benevolent Fund, held on February 4th, Lieut.-Colonel Sir Alfred Pearce Gould in the chair, several applications for assistance were received, and grants amounting to £450 were made. Applications for assistance, marked "Confidential," should be addressed to the Honorary Secretary, 11, Chandos Street, Cavendish Square, W.1. For this Fund about £21,000 has been raised; it is believed that a further £9,000 will be required. Subscriptions should be addressed to the Honorary Treasurer, at the above address.

THE programme of the Rockefeller Foundation for 1919 includes large enterprises in public health and medical education and the completion of its war work. The public health activities will be directed chiefly against yellow fever, tuberculosis in France, malaria, and the hookworm disease. General Gorgas is the head of the Yellow Fever Commission. The Commission on Tuberculosis in France will continue its work with a larger budget; the war against hookworm will be waged in twelve States of the American Union and twenty-one foreign states and countries. Grants have been made for special studies and demonstrations in mental hygiene, for school hygiene and public health at Johns Hopkins University, and for the development of public health nursing. The chief work on medical education will be the development of training in modern medicine in China.

AN order by the Food Controller dated February 14th removes the restrictions on the use of lard in the preparation of articles other than foodstuffs, and it may accordingly now be used in the manufacture of ointments and other medicinal preparations. It will be remembered that the committee appointed by the Home Office in August, 1914, to deal with the question of economy in the use of drugs during the war, issued a memorandum on medicinal oils and fats, which was published in the JOURNAL of September 14th, 1918, p. 296. It was stated therein that since lard could no longer be dispensed either as such or as an ingredient of a prescription, a base consisting of 5 per cent. wool fat, 10 per cent. hard paraffin, and 85 per cent. soft paraffin had been placed on the market as a suitable substitute for most cases in which lard would have been ordered. Formulae were constructed containing this base (named for convenience *Adeps factitius*), and these and other war emergency formulae were published by the Pharmaceutical Society in the *Codex Addendum*, 1918.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

The postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

The address of the Central Medical War Committee for England and Wales is 429, Strand, London, W.C.2; that of the Reference Committee of the Royal Colleges in London is the Examination Hall, 8, Queen Square, Bloomsbury, W.C.1; and that of the Scottish Medical Service Emergency Committee is Royal College of Physicians, Edinburgh.

QUERIES AND ANSWERS.

INCOME TAX.

H. M. D. inquires how much income tax he will have to pay on a total income of £550. He pays £67 6s. 8d. in insurance premiums.

*** As H. M. D. does not state what portion of his income is unearned, the answer cannot be given. It may, however, be sufficient to say that if his income is £500 earned and £50 unearned the total tax payable will be as follows:

	£	s.	d.
1. *Earned*	500	0	0
Less abatement £100 0 0			
„ Life assurance ... ... £67 6 8—167	6	8	
	332	13	4
Duty on £332 13s. 4d. @ 3s.	49	18	0
2. *Unearned*: £50 @ 3s. 9d.	9	7	6
Total	£59	5	6

LETTERS, NOTES, ETC.

A DISCLAIMER.

DR. PAUL BOUSFIELD (London) writes to disclaim all knowledge of the identity of the writer of an article in the lay press eulogizing the psycho-therapeutic treatment at the Ministry of Pensions clinic, or of the fact that any such articles were about to appear.

SHORTAGE OF PRIVATE NURSES.

A CORRESPONDENT in the Midlands sends us a strongly worded request to call the attention of the military nursing authorities and the Ministry of Labour to the great shortage of private nurses which, in view of the fresh outbreak of influenza, is causing serious hardship to private patients. He argues that as a million and a half men have been demobilized many army nurses could now be released, but states that very few have been so released, and these either on compassionate grounds or because they had been asked for by bodies such as health committees or district nursing societies. Apparently the position of the private nurses who form the bulk of the members of the Queen Alexandra Nursing Reserve and Territorial Nursing Association has not been appreciated by the authorities, as they are being retained by the army. The matter is undoubtedly urgent, and will, we trust, receive early attention.

IS INFLUENZA INFECTIOUS DURING INCUBATION?

DR. HELEN G. LEYTON (Oxford) writes: So far as I am aware, little attention has been paid to the possibility—we ought perhaps to say to the probability—of influenza being infectious during incubation. The following pair of cases goes far, I think, to substantiate it: Mrs. A., an invalid, was attended only by her daughter and by Mrs. B. She saw no other visitors. On Monday, February 10th, Mrs. B. last attended her, Mrs. B. being then presumably in the incubation stage of influenza, with which she fell ill on Wednesday, February 12th. On Friday, February 14th, Mrs. A. also was attacked. The inference is that Mrs. B., while in the incubation stage of the disease, infected Mrs. A. Her incubation period appears to have been at least three days, but I have seen several cases in which certainly a week has elapsed from the time of possible infection to the onset of the disease. The possibility of the incubation period being infectious necessitates more drastic though less hopeful prophylaxis.

THE PREVENTION OF VENEREAL DISEASE.

SURGEON COMMANDER P. HAMILTON BOYDEN, R.N., writes: With respect to the article which appeared in your issue of February 8th under the names of Sir Archdall Reid and myself, I desire to make it clear that the prevalence of gonorrhoea amongst those who used nargol jelly as a preventive applied to the period prior to April 1st, 1918. Shortly after this date the issue of nargol jelly was discontinued in the Royal Navy, calomel cream remaining the sole official prophylactic against both syphilis and gonorrhoea.

"A REFORMED MEDICAL BOARD."

MEMBERS of National Service Medical Boards who wished to relieve the tedium of waiting for the next recruit to present himself might have been advised to read the *Short Diary of a Reformed Medical Board*, by J. S. M. (Warrington: Mackie and Co., Ltd.). The essence of the reform is stated to consist in appointing a barrister with the status and emoluments of a recorder as president, since none but a barrister can appreciate the value of evidence. Before this individual Captains Koff and Flem, R.A.M.C., appear to represent the War Office, while Drs. Pessary Smith and Panell Jones represent the recruit through the Local Government Board. The cases are argued at great length, and his Honour's summing up is worthy of the highest traditions of the legal profession. On the whole, an amusing *jeu d'esprit*.

THE TREATMENT OF WAR PSYCHONEUROSES.

DR. J. E. MIDDLEMISS, Medical Officer to the Leeds Mental Deficiency Act Committee, (late) Lieutenant R.A.M.C., writes: In your issue of February 8th Captain Prideaux evidently wishes to pin me down to facts, though I am not conscious of having burked the facts in any remarks I have made. Need I reiterate that it is impossible for me or any other writer to traverse Captain Prideaux's findings? When he states that he finds that "forgotten experiences are the rule in psychoneurotic patients" I must necessarily accept his statement. Apart from my own experience, *haud parva res*, he will perhaps allow me to extend the same consideration to the observations of other writers in this field. There is fortunately in contemporary medical literature abundant evidence that many cases of psychoneurosis are successfully treated every day without invoking the principles of psycho-analysis. It is, of course, open to Captain Prideaux to object that these cases, like his own, if analysed, might reveal "forgotten experiences." The fact remains that the cases in question have been cured without any reference to such experiences, and this not empirically but by a logical and reasoned process. Many men, for instance, have broken down in the present war simply through a want of adaptability. The recognition of this fact and a restoration of the sufferer to his normal *milieu* are frequently all that is necessary to bring about a "cure." The treatment may seem rather banal, but this detracts nothing from its efficacy, and it is fundamentally rational. This is the type of case I had in mind when I asserted that "where the all-pervading sense of depression is present, argument, persuasion, and counter-suggestion are usually futile." This may or may not serve to answer my critic's inquiry as to what form of treatment is available other than psycho-analysis, counter-suggestion, etc. It is no part of my business to make an inventory of the recognized forms of mental treatment, but there are quite a number. Assuming that none of them are successful, why not evolve one suited to the exigencies of the case, a sort of mental autogenous vaccine? If the patient will not conform to your method, the only way out of the impasse is to adapt your method to the patient, however destructive it may be to one's personal predilections.

THE following appointments of certifying factory surgeons are vacant: Clevedon (Somerset), Sheffield, East (Yorks, West Riding), Ballyward (Down), Braemar (Aberdeen), Castlederg (Tyrone), Wakefield (Yorks, West Riding), Wrotham (Kent), Gortin (Tyrone), Broughton Astley (Leicester).

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